STUDY MANUAL

FINANCE AND FINANCIAL MANAGEMENT (PEA 2)

NIGERIAN COLLEGE OF ACCOUNTANCY

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Recommended Further Readings

MODULE 1

1.00   **FINANCIAL ENVIRONMENT**

1.01   Learning Outcomes

On successful completion of this module, students should be able to:

i.   Examine the concept of finance

ii.   Discuss the meaning of Financial Management

iii. Appraise the functions of the financial manager

iv. Evaluate the various finance functions or decisions

v.   Explore the financial and non-financial objectives of a firm

vi. Scrutinize scope of directors' responsibilities, disclosure requirements and creative accounting

vii. Review what corporate governance means, its essence and principles.

1.02 Financial Environment

Finance is described as the science of, or the management of money to derive ultimate benefits. From this description, three concepts of finance can be understood. The first is finance is defined simply as money. This concept of finance is more common to the layman. Here, finance is taken to mean money used or needed to support an activity or project. Thus, when we say that finance for education comes from the taxpayer we mean that the money used to pay for running education comes from the taxpayer. Finance could also mean the provision of money for a project. Therefore, we can say that he borrowed money to finance the takeover bid, or that the plan was financed by government grant or that something is publicly financed.

The second concept of finance is that which looks at it as the management of money. When finance is viewed from the management perspective, we can say for, instance, an expert in finance, when we refer to a finance director or a minister of finance or any officer charged with the management of money. Management of money is, of course applicable to private individuals, corporate bodies and governmental agencies. At the individual level, management of money finds expression on how the individual allocates his income between consumption and investment, how he raises money to augment his income in the event of a shortfall, or to provide for investment beyond what he can save from his normal income. At the corporate level, management of money deals with the various sources and means of raising money for corporate activities as well as the effective utilization of the money to achieve corporate

objectives. At the governmental level, management of money deals with government revenue and effective utilization of same in the funding of government projects and programmes.

The third concept sees finance as a discipline. As the science of money, finance is a body of facts, principles, and theories dealing with the raising of money and the utilization of same by individuals, business units and governmental agencies. It also includes the study of financial institutions and markets as well as the activities of government, especially those that are relevant to the financing decisions of firms and individuals.

Financial Management: According to Van and Wachowicz (2009) financial management is concerned with the acquisition, financing, and management of assets based on a set goal. Thus the decision function of financial management can be broken down into three major areas: the investment, financing, and asset management decisions.

The Chartered Institute of Management Accountants (CIMA) defines financial management as the identification of possible strategies capable of maximizing an organization's net present value, the allocation of scarce resources among competing opportunities and the implementation and monitoring of the chosen strategy so as to achieve stated objectives.

Thus, financial management can be recognized as those aspects of the overall strategic plan of an organization that concern the financial managers. For instance, the many aspects of a business plan, i.e. marketing and sales plan, production plan, personnel plan, capital expenditure plan, etc. have far-reaching financial implications. These all primarily concern the financial manager as they will be expressed in financial terms for the purpose of determining the financial needs and evaluating the overall performance of the organization. The overall performance itself can be translated into financial terms.

For as much as the most crucial decisions of a firm are those which relate to finance, Managers, are interested in the subject of financial management because an understanding of financial management provides them with conceptual and analytical insights to make those decisions skillfully. In essence, financial management as a discipline is concerned with the planning and controlling of the firm's financial resources or assets. Financial management is of enormous benefit to practicing managers.

1.03 Functions of the Financial Manager

The duty of the financial manager is to manage finance. This duty revolves around two questions. The first is: what assets should the firm invest in and the second is: how should the money be invested be raised? The first question which involves deciding on the various assets to be acquired constitutes capital budgeting or investment decision. The second question which deals with raising money constitutes a financing decision. Dividend decision has also been added as a major function of the financial manager.

The Investment Decision

A firm's investment decisions involve capital expenditures. They are, therefore, referred to as a capital budgeting decision. A capital budgeting decision involves the decision of allocation of capital or commitment of funds to long-term assets that will yield benefit (cash flows) in the future. Two important aspects of the investment decision are:

i. The evaluation of the prospective profitability of new investments, and

ii. The measurement of a cut-off rate against which the prospective return of new investments could be compared.

The future benefits of investment are difficult to measure and cannot be predicted with certainty. A risk in investment arises because of the uncertain returns. An investment proposal should, therefore, be evaluated in terms of both expected return and risk. Besides, the decision to commit funds in new investment proposal, capital budgeting also involves replacement decision, that is, the decision of recommitting funds when an asset becomes less productive or non- profitable.

The Financing Decision

This is the second function of a financial manager and is an important function that involves the decision on the sources of funds. He or she must decide when, where from and how to acquire funds to meet the firm's investment needs. In making this decision, the central issue before the financial manager is to determine the appropriate proportion of equity and debt. The mix of debt and equity is known as the firm's capital structure. The financial manager must strive to obtain the best financing mix or the optimum capital structure for his or her firm. The firm's capital structure is considered optimum when the market value of shares is maximized.

The Dividend Decision

A Dividend is a return on investment and is paid by a company to its providers of equity finance (shareholders). From the shareholders' viewpoint, dividends represent compensation for postponing consumption. The dividend policy of the firm relates to various decisions on payments of a dividend. The firm regards the 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.

Critical questions in this regard include: 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 which would only be arrived at by skillful analysis.

Who is the Financial Manager?

Since the financial manager manages Finance, it follows that any person involved in financial management is a financial manager. We can, therefore, say that a financial manager is any person responsible for the corporate investment and financing decisions. By this reasoning, virtually all members of top management in a large firm qualify as financial managers, because every one of them is, to some degree, involved in financial management decision.

For instance, the production engineer who designs a new plan for a proposed new project can be said to be involved in financing decision because his design will determine the kind of asset

the firm will invest its funds. Also, a marketing manager who commits the firm to a major advertising campaign makes an important investment decision because the campaign is an intangible asset that will pay off in future sales earnings. Furthermore, a personnel manager who proposes recruitment of highly skilled technical staff for the production department is involved in investment decision because his proposal determines the direction of the firm's investment in human capital.

But within the overall management team, there are managers who specialize in finance and who are directly responsible for financial management functions. In a typical firm of the American setting, the chief financial officer goes by the title vice president finance. Below the vice president finance, are two key officers namely, the treasurer and the controller. The treasurer is responsible for raising capital and dealing with suppliers of capital. The controller checks to see that the available fund is used correctly and effectively. He is responsible for the accounting and budgetary systems including capital budgeting, internal audit, payroll, taxes, and custody of records. In a small firm in the Nigerian setting, the chief financial officer may go by the title, chief accountant. But in a large corporate organization, the chief financial officer is titled director of finance.

1.04   Objectives of Profit-Seeking Organizations

Aims and objectives are the 'ends' that an Organisation seeks to achieve. It then has to decide the means it will use to achieve those ends draw up a plan and devise a strategy. Most organizations have general or overall aims which they can break down into specific objectives or targets.

By setting aims and objectives, companies give themselves a sense of purpose and direction. This provides a framework around which to create their plans. With an overall plan in place, a company can set particular targets and monitor its progress towards reaching them. Targets can vary from a sales target and/or a profits target to a zero-accident target. Having a sense of direction and a coherent, overall plan is particularly important to for a global organisation like Michelin, which produces many different product lines worldwide.

One major challenge is to communicate the plan clearly to everyone in a form that they can understand and put into practice. In 2002, the Michelin Group, at the initiative of its Managing Partners, Edouard Michelin and René Zingraff, launched the 'Michelin Performance and Responsibility' approach. Based on the Group's traditional five values, it established a formal framework for the Group's day-to-day activities and responsibilities in all areas: economic, social, environmental and ethical.

Many large organisations set out their overall purpose in the form of a mission statement. Michelin's mission is 'to make a sustainable contribution to progress in the mobility of people and goods by constantly enhancing freedom of movement, safety, efficiency, and pleasure when on the move.'

The company intends to achieve this goal through the following means:

i. Constant improvement of the technical performance, its products' and its type-related services' quality

ii. Alongside its core activities, development of new technologies or products to support sustainable mobility

iii. Ongoing active role both in public debate on future modes of transport and in researching relevant ways of transition towards sustainable mobility

iv. Delivering appropriate messages to its customers, enabling them to adopt sound purchasing behaviors and positive attitudes towards road safety and environmental issues.

Organisation must be based on a sound economic footing in order to achieve its mission. As such, Michelin intends to remain the world No. 1 in types and mobility assistance, and to perform well over the long-term.

Having overall aims brings a sense of direction for everything Michelin does. These are then translated into particular objectives and targets for various areas:

i. Markets and customers: sales growth, market shares, product reliability, delivery

ii. Employees: safety at work, training, diversity

iii. Economic performance: operating margin, free cash flow, return on assets, level of investments

iv. Environmental policy: end-of-life type recovery, number of sites with a certified environmental management system

v. Production: manufacturing cost per type, production capacities, flexibility.

Corporate Wealth Maximisation

This objective encompasses all interest groups in a business organisation as against one interest group (the shareholders) being considered. This is an alternative objective to shareholders wealth maximisation. The emphasis is on stakeholders. The individual group's interests are treated at par as against maximizing 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 maximize long-run earnings and to retain enough to increase the corporate wealth for the benefit of all stakeholders.

Profit Maximization

Frequently, profit maximization is offered as the proper objective of the firm. 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. Profit maximisation is a good objective of a business but it has its deficiencies.

1. 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.

2.   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.

3.   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.

Profitability Maximization

This is a more preferable objective compared to 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), Return on Asset (ROA) and Earnings per Share (EPS), etc. Some of the disadvantages of this objective are:

1.   The challenge of defining profit, i.e. which profits and capital are to be used;
2.   The uncertainty that goes with the earning of the profits (risk) is ignored;
3.   It ignores the time value of money; and
4.   It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency.

1.05 Objectives of a Nonprofit Organization

Nonprofit organizations aim to improve society in some way, bettering the communities they serve. In many cases, these nonprofits are closely monitored to ensure that they work to reach these objectives. By keeping some principles of sound objective-setting in mind when creating their objectives, nonprofits can improve their chances of success.

A strategic plan is a roadmap that outlines the organization's mission, goals, and objectives, desired outcomes and metrics for measuring progress. Not much difference exists between nonprofits and for-profits in creating strategic plans. Nonprofit strategic plans are usually developed collaboratively by a stakeholder group that includes community leaders, client representatives, board members and the nonprofit's management. An outside consultant can also be involved.

For optimal effectiveness, non-profit objectives should be measurable. With measurable objectives in place, it is easier for non-profits and the companies monitoring them to determine whether or not they have reached these goals. For example, if the non-profit sets a goal of assisting 100 families in finding affordable housing during the next year, they can easily determine whether or not they have reached this target instead of simply hypothesizing as to their success level.

1 Beneficiaries

Non-profits work to help others, so they should list beneficiaries in the objectives. For example, if a non-profit seeks to assist the elderly in maintaining their homes and independence, they should state so clearly in their objectives, making it immediately apparent who will reap the benefits of their efforts.

2 Projects

In many cases, non-profit organizations carry out an assortment of projects when trying to help their beneficiaries. Instead of just making a blanket statement, to sum up all of these projects, non-profits can draw attention to each, listing some of their most far-reaching projects specifically in their objectives. By doing so, they can advertise their projects, making it clear how their existence benefits society.

3 Time

Non-profit organizations usually have a limited amount of time to accomplish their stated aims. They should list the time in which they will accomplish each of their initiatives in their objectives. By stating that they will accomplish a listed goal, "within the next year" or "during this fiscal period," non-profits are providing those overseeing them with another target by which their success can be measured.

4 Objectives

An organization creates objectives based on its goals. According to the non-profit, business-assistance organization SCORE, objectives are specific circumstances to be achieved within a stated time frame that meet a particular goal. Unlike goals, objectives must be measurable by some means, such as by dollars or percentages, so progress is determined. In the veganism example, for the goal of getting information on veganism out to the public, an objective might be to publish two books during the next year, one that covers veganism and public policy issues, and another that is a cookbook with a variety of recipes, that are both placed in 80 percent of American libraries.

1.06 Inter-Relationship between Financial Management, Management Accounting, and Financial Accounting

Management accounting has its focus on providing information within the company so that its management can operate the company more effectively. Managerial accounting and cost accounting also provide instructions on computing the cost of products at a manufacturing enterprise. These costs will then be used in the external financial statements. In addition to cost systems for manufacturers, courses in managerial accounting will include topics such as cost behavior, break-even point, profit planning, operational budgeting, capital budgeting, relevant costs for decision making, activity-based costing, and standard costing.

Financial accounting has its focus on the financial statements which are distributed to stockholders, lenders, financial analysts, and others outside of the company. Courses in financial accounting cover the generally accepted accounting principles which must be followed when reporting the results of a corporation's past transactions on its balance sheet, income statement, statement of cash flows, and statement of changes in stockholders' equity.

Data provided by Cost and Financial Accounting is further used for the management of all processes associated with the efficient acquisition and deployment of short, medium and long-term financial resources. Such a process of management is known as Financial Management. The objective of Financial Management is to maximize the wealth of shareholders by taking effective Investment, Financing and Dividend decisions. Investment decisions relate to the effective deployment of scarce resources in terms of funds while the Financing decisions are concerned with acquiring optimum finance for attaining financial objectives.

The last and very important 'Dividend decision' relates to the determination of the amount and frequency of cash which can be paid out of profits to shareholders. On the other hand, Management Accounting refers to managerial processes and technologies that are focused on adding value to organizations by attaining the effective use of resources, in dynamic and competitive contexts. Hence, Management Accounting is a distinctive form of resource management which facilitates management's 'decision making' by producing information for managers within an organization.

1.07   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 optimizing 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:
      i.   Lay solid foundations for management and oversight;
      ii.   Structure the Board to add value;
      iii.   Promote ethical and responsible decision making;
      iv.   Safeguard the integrity of financial reporting;

v. Make continuous, timely and credible disclosures to the Stock Exchange;

vi. Respect the rights of shareholders;

vii. Recognise and manage risk;

viii. Adhere to Nigeria's Corporate Governance Code of Conduct for company directors;

ix. published in 2003 under the aegis of Securities and Exchange Commission;

x. Encourage enhanced performance evaluation;

xi. Remunerate fairly and responsibly; and

xii. Recognise the legitimate interest of stakeholders.

The Essence of Good Corporate Governance

i. Corporate Governance aims to promote a culture in which Directors will give priority to the ethical pursuit of the shareholders' best interest;

ii. 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;

iii. 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;

iv. It ensures the credibility of companies, and the existence of a managerial system which promotes creative entrepreneurship;

v. Corporate Governance helps in maximising the corporate value by enhancing transparency and efficiency;

vi. The role of Corporate Governance is to prevent the exploitation of investors by the managers;

vii. Good Corporate Governance prevents fraudulent practices through the mechanisms designed by the Board and management; and

viii. Corporate Governance ensures that the suppliers of finance to companies have their rewards.

1.08 Scope of Directors' Responsibilities/ Adequacy of Disclosure Requirements

i. A duty to act in good faith in the best interests of the company;

ii. A duty to act with care and diligence;

iii. A duty to avoid conflict in the position of a director and/or any interest that the director may have; and

iv. A range of duties which prohibit the misuse of information obtained by directors.

There are series of other duties and functions more procedural in nature contained in the Corporations Law which will not be included in this guide but with which directors should become familiar, for example, concerning the accounts of the company and issues of shares.

Under the Corporations Law, directors must act in good faith in the best interests of the company.

A statutory duty of care of the Corporations Law which provides that a director of a corporation must exercise his/her powers and discharge his/her duties with the degree of care and diligence that a reasonable person would exercise, if they:

1   Were a director or officer of a company in the company's circumstances; and

2   Occupied the office held by, and had the same responsibilities within the company as, the director or officer.

Until recently there has been little distinction made in treating the duties, functions, and responsibilities of different types of directors. However, the courts have tended to recognise that directors cannot be responsible for all aspects of the company and have tended to limit the liabilities of directors where something has gone wrong.

As the community has become more anxious about the performance of companies and the fact that some high profile companies have failed, the courts have started to impose a higher standard and expectation on directors. This has led to a plea by directors that both the Corporations Law and the Common Law should recognise a distinction between executive directors (i.e. those that have management responsibilities), and non-executive directors (i.e those that do not have management responsibilities).

The Corporations Law provides that a director will not be responsible for the actions of a delegate if the director believed on reasonable grounds:

3 At all times, that the delegate would exercise the power delegated in accordance with the duties imposed on directors and in accordance with the Corporations Law; and

4 In good faith, after making proper enquiry (if the circumstances indicated the need for enquiry), that the delegate was reliable and competent in relation to the power delegated.

In general, it will be more difficult for persons to establish that the directors are in breach of their duty if they follow procedures and engage in due diligence types of activity to ensure that all necessary safeguards are provided. The law also provides a clear indication that different standards will be imposed on directors depending on;
    i.   The nature of their experience,
    ii.   The corporations that they are directors of, and
    iii.   Related circumstances.

1. Personal Liability

There are many approaches to directors' liabilities under legislation and common law. It is worthwhile noting that a director can become personally liable in the following circumstances:
    i.   For statements in, and omissions from, a prospectus; insolvent trading;
    ii. Trade practices issues;
    iii. Pollution and the use and storage of environmentally hazardous chemicals and dangerous goods;
    iv. Breaches of occupational health and safety legislation; and
    v.   Breaches of tax legislation.

There are almost as many different statutory defenses to directors' statutory liability as there are offences. Directors can seek some protection by adopting appropriate systems which are designed to ensure that:

      1 Matters which can result in personal liability are properly supervised; and

      2 The risk of contravention of laws imposing personal liability is minimized.

These checklists are updated as often as required to reflect any revisions in the source documents.

The updated Guidance on Audit Committees has introduced a number of new disclosures which reflect the changes to the Code along with other good practice. Additional disclosure recommendations in the audit committee report include:

How the audit committee composition requirements have been addressed; how the performance evaluation of the audit committee has been conducted; the current external audit partner's name and for how long the partner has held the role; advance notice of any plans for retendering of the external audit; the committee's policy for approval of non-audit services; the audit fees for the statutory audit of the company's consolidated financial statements and the fees paid to the auditor and its network firms for audit related services and other non-audit services, including the ration of audit to non-audit work; for each significant engagement, or category of engagements, an explanation of the services provided and why the audit committee concluded that it was in the interests of the company to purchase them from the external auditor; and explanation of how the committee has assessed the effectiveness of internal audit and satisfied itself that the quality, experience, and expertise of the function is appropriate for the business; the nature and extent of interaction (if any) with the FRC's Corporate Reporting Review team; when a company's audit has been reviewed by the FRC's Audit Quality Review team, disclosures about significant findings and the resulting actions they and the auditors plan to take. This disclosure should not include the audit quality category awarded.

2. Disclosures under the 2014 Code

Our Corporate Governance Disclosure Checklist (For periods commencing on or after 1 October 2014) covers the disclosure requirements as a result of the 2014 Code amendments. Significant changes include:

3. Going Concern

The September 2014 amendments introduced a requirement that, in addition to a statement that the business is a going concern, the directors will also have to make another statement indicating that they have a reasonable expectation that the company will be able to continue in operation and meet its liabilities as they fall due over an assessed period, the length of which must also be disclosed. In addition, the directors' responsibility for risk management is enhanced to include making a robust assessment of the principal risks facing the company and a specific responsibility for monitoring the company's risk management and internal control systems.

4. Risk Management and Internal Control

Directors are required to confirm in the annual report that they have carried out a robust assessment of the principal risks facing the company, including those that would threaten its business model, future performance, solvency or liquidity.

Directors are required to describe those risks and explain how they are being managed or mitigated

5. Relations with Shareholders

The September 2014 amendments included a provision requiring companies to explain what action they intend to take in response to situations where a significant proportion of votes have been cast against a resolution at any general meeting. This is particularly relevant to resolutions on directors' remuneration.

The FRC also publishes the UK Stewardship Code which sets out good practice as to how investors interact with investee companies. The FRC asks investors to report on a 'comply or explain' basis and the Financial Conduct Authority requires certain investors to do so or else explain their alternative strategy to achieve the same aims.

1.09   Creative Accounting

'Creative accounting' is a term used to describe a process whereby accountants use their knowledge of accounting rules to manipulate the figure reported in the accounts of a business. Some authors in the UK, with a different perspective, has identified the issue:

1. Griffiths (1986), writing from the perspective of a business journalist observes that "Every company in the country is fiddling its profits. Every set of published accounts is based on books which have been gently cooked or completely roasted. The figures which are fed twice a year to the investing public have all been changed in order to protect the guilty. It is the biggest con trick since the Trojan horse…… In fact, this deception is all in perfectly good taste. It is totally legitimate. It is creative accounting."

2. James (1988) writing from the perspective of the accountant argues that: "the accounting process consists of dealing with many matters of judgement and of resolving conflicts between competing approaches to the presentation of the results of financial events and transaction….. This flexibility provides opportunities for manipulation, deceit, and misrepresentation. These activities – practiced by the less scrupulous elements of the accounting profession – have come to be known as 'creative accounting'.

3. Smit (1992) reports on his experience as an investment analyst as follows: "we felt that much of the apparent growth in profits which had occurred in the 1980's was the result of accounting sleight of hand rather than genuine economic growth, and we set out to expose the main techniques involved, and to give live examples of companies using those techniques."

i.   Window dressing:

Window dressing includes making a fine external show of sound corporate governance principle and practice, while minimizing failures. Some companies' mission statements, social responsibility, and sustainable reports, as well as core principles, suffer the window dressing window dress can also involve showing financial results in the best possible light, while hiding weaknesses, although this runs the risk of an adverse audit report or worse.

As of yet the term window dressing has been used in popular fashion, adopted from financial vocabulary, which may define such activities as „the use of short-term

financial transactions to manipulate accounting values around the quarter-end reporting dates" (Allen -Saunders, 1992). Whereas the financial meaning of window dressing has been determined, definitions of window dressing by using CSR are largely lacking. However, Weaver –Trevino - Cochran (1999) and Griffin-Weber (2006) provide theoretical insight that window dressing is a strategically determined activity.

Window dressing is an aggregate term to denote any of a number of specific activities. Whitewash, blue wash, and green wash are primarily mentioned by NGOs.

Blue wash, for instance, criticizes corporations which associate themselves with the "humanitarian community through voluntary association with the United Nations, without provisions for accountability" (FOEI, August 23, 2002). One of these enablers is the UN Global Compact which comprises ten principles based on global issues such as human rights and environmental impact. Subscribed members are required to refer to the integration process of these principles in its annual report of which a short statement is to be provided on the global compact's website (Williams, 2004). Only when the failure occurs to deliver on the latter can membership be withdrawn. Precisely for that reason, the Global Compact is criticized for enabling firms to reap benefits without complying with the prescribed principles, thereby enabling window dressing (Behrman, 2001; Hoedeman, 2002). FOEI (August 23, 2002) categorizes whitewash under the popularly used term green wash. Green wash may be defined as, the phenomenon of socially and environmentally destructive corporations attempting to preserve and expand their markets by posing as friends of the environment and leaders in the struggle to eradicate poverty" (FOEI, August 23, 2002).

Criticism occurs through, for instance, the „Green wash Academy Awards", developed by Corp Watch (March 2001), which aims at singling out the most sophisticated green washing programs.

ii.   Rewards and sanctions

We had discussed delegating responsibility and activity, and control procedures to ensure that the board is able to monitor and manage the performance of the Organisation.

The next step is to ensure that senior management's successes and failures are communicated to them, and to ensure that appropriate rewards, sanctions, and training are implemented.

Practical aspects of performance management are important because they relate closely to motivation. It is a truism that "What gets measured gets done". However, there is another consideration. Rewards that involve cost are a call on shareholders' assets.

The whole subject of bonuses, in particular, can be a hot potato in the media and at shareholders' meetings. Furthermore, bonus schemes rapidly become out of date as the context and objectives change.

There are three broad types of incentive: financial (e.g. bonuses or penalties); operational (e.g. training/development, or granting more or less responsibility); and reputational (e.g. status or public acclaim/criticism).

When setting up incentive systems, it is worth assessing the motivations of the key players, including the balance between financial and other motivations, and whether they operate at organisational, team or individual level.

Check that they only relate to outcomes over which the players have control or significant influence.

Link the incentives to performance measures which lead to the desired (long-term) outcomes in a predictable way. A single measure may not capture the relevant aspects of performance, but any set of measures must be kept manageable.

Ensure the rewards and sanctions are cost-effective. Where they involve financial elements, it may be sensible to model the operation of the system to help define appropriate values or ranges.

Introduce safeguards to prevent unintended behaviours. Approaches can include maintaining a degree of independence in performance assessment and validating key performance measures.

Build regular internal and external reviews of the effectiveness of the sanction or reward mechanism into the programme's overall performance management cycle.

Consider phasing in any new sanction or reward mechanisms gradually, or on a pilot basis, to identify and address any dysfunctional behaviour.

1.10   Review Questions

1. If all companies had an objective of maximizing shareholder wealth, would people overall tend to be better or worse off? Discuss.   (5marks)
2. Differentiate between the objectives of maximizing earnings with that of maximizing wealth. (5marks)
3. What is financial management? (2marks)
4. Is the goal of zero profits for some finite period (three to five years, for example) ever consistent with the maximization-of-wealth objective? (5marks)
5. Explain why judging the efficiency of any financial decision requires the existence of a goal. (5marks)
6. What are the three major functions of the financial manager and how are they related? (6marks)
7. What is corporate governance? What role does a corporation's board of directors play in corporate governance? (7marks)
8. You are the financial manager of a state government-owned parastatal that is about to be privatized and listed on the stock exchange. What are the likely differences in management objectives that will arise as a result of the change? What are the likely changes in emphasis on the strategic and operational decisions as the financial manager? (10marks)

9. Joe Benson was successful at the interview for financial manager organized by Bepuck Consultants, on behalf of Paul Samson Industries, a medium-sized company dealing in household consumables. He has just been offered the job. What a function is he expected to perform? In your opinion, what should be the appropriate objective for commercial enterprises? (20marks)

MODULE 2

2.00   **FINANCIAL MATHEMATICS**

2.01 Learning Outcomes

On successful completion of this module, students should be able to:
    i   Compute Annuities, Perpetuities, Present and Future Values
    ii   Determine what is risk and uncertainty
    iii Prepare a Decision Tree
    iv Measure the risk of business
    v   Evaluate and determine the best method(s) of minimizing business risks

2.02   Simple Interest (SI)
Simple interest is earned when Interest is paid on the Initial Principal invested at the end of each year. The interest is usually a percentage of the principal.

Illustration 2.

Calculate the S.I on a loan of ₦10, 000 for one year at 10%

Solution: $\dfrac{N10,000 \times 10}{100} = 1,000$

FORMULA: $SI = \dfrac{P \times T \times R}{100}$ ....   (1)

                         T = Time years

                         R = Rate percent

                         P = Principal

Illustration 2

Calculate SI on N 4,500 borrowed for 2.5 years at 15% per annum.

Solution: SI = $\dfrac{N4,500 \times 5\frac{1}{2} \times 15}{100} = N1,637.50$

The formula (1) above can be turned to obtain T, R, and P.

$P = \dfrac{100I}{T \times R}$ ... (2) $R = \dfrac{100I}{P \times T}$ ... (3) $T = \dfrac{100I}{P \times R}$ ...   (4)

Illustration 3

What principal will earn an interest of ₦8, 100 in $12^1/_2$ years at 17% p.a?

$$P = \frac{100 \times 8,100}{17 \times 12.5} = N3,811.76$$

2.03   Compound Interest

In Compound Interest, the interest is added to the principal invested at the end of each year and the amount now forms the principal to be invested for the New Year. Hence interest will earn its own interests and the amount invested grows at a geometric rate.

Illustration 4

If ₦2, 000 is invested at 21% per annum, Interest for the first year

I_1 = ₦2, 000 $\times$ 0.21 = ₦42.

Principal for the second year: P_2 = 2,000 + 42 = ₦2, 042

Interest for the 2nd year: I_2 = 2,042 x 0.21 = ₦428.8

Principal for the 3rd year: P_3 = 2,042 + 428.8 = ₦2, 470.8, etc.

In general, if P = Principal invested at r% p.a. Interest I = P $\times$ r% = Pr

Year 1: Amount = P + Pr% = P (1 + r %)

Year 2, Interest I_2 = P (1 + r %) $\times$ r% = Pr (1 + r)

Amount = P (1 + r %) + Pr% (1 +r %) = P (1 + Pr %) (1+r %) = P (1 +r %) 2

Year 3: Amount = P (1 +r %) 3 similarly, etc.

Hence for year n,

$$\text{Amount} = P (1 + r\%)^n \dots\dots\dots\dots (5)$$

Illustration 5

If ₦50, 000 was invested at 15% p.a. Calculate the amount of the investment in 3½ years at compound interest.

Solution:

Amount in 3½ years = 50,000 $(1.15)^{3.5}$ = ₦81, 547.84

2.04   Multi-Period Compounding: Nominal and Effective Rates of Interest

Compound Interest may be earned more than once in a year, say, semi-annually, quarterly, monthly etc. The total amount received in n years is

$$A_n = P \left(1 + \frac{r\%}{m}\right)^{mn} \dots\dots\dots\dots\dots\dots\dots\dots \qquad 6)$$

Where: r% = Nominal Annual interest charged

m = the number of times interest is compounded in a year.

$\dfrac{r\%}{m}$ = the Effective Rate of interest

Illustration 6

A civil servant invested ₦25, 000 in a Pension Fund which pays 10% interest p.a. compounded twice a year. How much will his investment be worth in 12 years?

Solution

$$A_{12} = 25,000 \left[1 + \frac{0.10}{2} \right]^{2 \ x \ 12} = N80,627.50$$

In like manner, interest rates may be defined for shorter periods than annually. For example, a finance house might offer 5% per quarter, which actually does not amount to paying 20% p.a. since interest is computed per quarter and the amount grows per quarter. We need to determine the Effective Annual Interest Rate which is

$$R\% = \left[(1 + r\%)^{\frac{12}{n}} - 1 \right] \dots p.\,a. \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots .. (7)$$

Where: n = number of months in the period of compounding

                r = interest rate for each period of compounding

      OR

$$R\% = \left[(1 + r\%)^{\frac{365}{x}} - 1 \right] \dots p.\,a. \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots .. (8)$$

Where: x = number of days in the period of compounding.

Illustration 7

Calculate the Effective Annual Rate of interest and hence, the total amount of Investment if ₦65, 000 is invested for 5 years and interest is

   i.   3% per month compounded
   ii.   5½ % per quarter compounded
   iii.   2% per 30 days compounded.

Solution

   i. 3% per month compounded

$$R\% = \left[(1.03)^{\frac{12}{1}} - 1 \right] = 42.58\% \ \text{p.a.}$$

Hence A$_5$ = 65,000 (1.4258)^5 = N383,006.73

   ii. 5½ % per quarter compounded

$$R\% = \left[(1.055)^{\frac{12}{3}} - 1 \right] = 23.88\% \text{ p.a.}$$

A₅ = 65,000 (1.2388)⁵ = N189, 635.37

iii.   2% per 30 days compounded:

$$R\% = \left[(1.02)^{\frac{365}{30}} - 1 \right] = 27.24\% \text{ p.a.}$$

A₅ = 65,000 (1.2724)⁵ = N216,786.21

2.05   Compound Interest with Increasing Annual Constant Investment: Compound Value of An Annuity (CVOA)

Definition of Annuity:

An Annuity is a series of annual cash flows of a constant amount. For example, a fixed sum may be paid into a pension fund at the end of each year. An investor may be adding to his investment a certain constant sum each subsequent year. If you promise to make a series of constant annual payments, you have created an annuity. Similarly, an investor may be receiving a constant annual return. These cash flows are Annuities.

There are two forms of Annuity:

a.   Ordinary Annuity (Annuity Regular) in which the stream of equal payments or receipts occur at the end of each year or payment period.

b.   Annuity Due- in which the stream of payments occurs at the beginning of each year or payment period.

a.   Ordinary Annuity (Compound Value of an Annuity)

Provided there is no withdrawal, the end value of ₦P annual constant investments made at end of each year or period is the Geometric series.

$S_n = P + P(1 + r)^1 + P(1 + r)^2 + P(1 + r)^3 + + + P(1 + r)^{n-1}$

$$= P \frac{\left[1 - (1 + r\%)^n \right]}{-r\%} \quad \text{............................ (9a)}$$

$$\text{Or} \quad S_n = P \frac{\left[(1 + r\%)^n - 1 \right]}{r\%} \quad \text{.......................... (9b)}$$

I.e. the Compound Value of Ordinary Annuity.

Illustration 8

Find the end value of annual constant deposits of ₦20, 000 into an account paying 5 ½ % p.a. for 6 years where payment is at each year end.

Solution

CVOA = 20,000 + 20,000(1.055)^1 + 20,000(1.055)^2 + 20,000(1.055)^3 + 20,000(1.055)^4 +

20,000(1.055)^5 = $\dfrac{20,000[1.055^6 - 1]}{0.055}$ = $N137,761.02$

An Alternative formula:

The following is an alternative formula to the above.

$$A_t = (A_o + \frac{a}{r\%})\,(1 + r\%)^t - \frac{a}{r\%} \dots\dots\dots\dots\dots (10)$$

Where :   A$_o$ = initial deposit at year 0 end

a = subsequent constant annual deposits at each year end.

r% = annual rate of interest.

Using the data in Example 13.8 above, we test formula (13.9b) as shown:

A$_o$ = 20,000, a =20,000, r = 0.055, n = 6 years.

$$\therefore \quad A_6 = (20,000 + \frac{20,000}{0.055})(1.055)^5 - \frac{20,000}{0.055} = N137,761.02$$ As earlier obtained.

The relation given in (13.10) above is more general since it is applicable when the subsequent constant annual investment is not the same as the initial deposit.

b.   Annuity Due (Future Value of an Annuity Due: FVAD)

Provided there is no withdrawal, the end value of an annual constant investment of ₦P made into a Fund at the beginning of each year or payment period if the fund pays r% p.a., is the sum of the Geometric Progression.

S$_n$ = P (1 + r)^1 + P (1 + r)^2 + P (1 + r)^3 + + + P (1 + r)^n

(1 +r) [P + P (1 + r) + P (1 + r)^2 + P (1 + r)^3 + + + P (1 + r)$^{n-1}$]

$$S_n = \frac{(1 + r)[p(1+r)^n - 1}{r} \dots\dots\dots\dots\dots\dots (11)$$

This is the Future Value of an Annuity Due (FVAD)

Illustration 9
End value of an investment of N50, 000 made beginning of each year for 20 years into a Fund paying 15% compound interest p.a. is

$$FVAD \ = \ \frac{50{,}000[1.15^{20} - 1](1.15)}{0.15} = N5{,}890{,}506.00$$

2.06 Discounting and Present Value of Cash Flows

Discounting

Due majorly to inflation, time has a corroding effect on money. That means a sum of ₦100, 000 today will buy more goods than the same ₦100, 000 would buy 5 years hence. As a result, we would require more than ₦100, 000 in 5years time to buy the same quantity of goods that ₦100, 000 will buy today. Therefore, ₦100, 000 in 5years time, should have a nominal value higher than ₦100, 000 today for the two amounts to have the same real value. This is why a rational investor will prefer ₦100, 000 today, to receiving the same ₦100, 000 in 5years time. Therefore, ₦1.00 invested today will have to grow into an amount nominally greater so that the future value will be equivalent to today's real value. Equivalently, if we expect a future sum of money, we would want to reduce that sum to be equivalent to today's (current) value.

For example; an investor, who has a required interest rate as 10 percent per year, may have an opportunity to receive an annuity of N1 for four years. The present value of N1 received after one year is, P= 1/ (1.10)^1 = N0.909; after two years, P=1/ (1.10)^2 = N0.826; after three years, P=1/ (1.10)^3=N0.751 and after four years, P=1/ (1.10)^4 =N0.683. Therefore, if N1.00 were to be received at the end of four years, today's value would be only N0.683. This is the subject of discounting.

That is, if S$_t$ = P (1 + r %)^t, then $P = \dfrac{S_t}{(1 + r\%)^t}$ .... (12)

Is the Present Value of ₦S$_t$ in t years at r% p.a?

Illustration 10

The PV of ₦50,000 at a discount rate of 17% p.a. for 2 years is $P = \dfrac{50{,}000}{(1.17)^2} = N36{,}525.68$

Discounting finds wide application in handling annuities and capital projects appraisal.

2.07 Present Value of Annuity

Let A = the constant annual cash flow at the discount rate of r% p.a.

The Present Value of the Annuity:

$$PV = \frac{A}{1+r} + \frac{A}{(1+r)^2} + \frac{A}{(1+r)^3} + + + + \frac{A}{(1+r)^n} \; for \, n \; years \; = \; A\left[\frac{1 - (1+r)^{-n}}{r}\right]$$

Which is a series in Geometric Progression with first term $\frac{A}{(1+r)}$ and common ratio $\frac{1}{(1+r)}$.

The factor $\left[\dfrac{1-(1+r)^{-n}}{r}\right]$ is usually computed for various values of n and r% and is available in financial tables as PV of Annuities.

Illustration 11

A bank loan of ₦120, 000 is to be repaid in ten equal annual instalments. How much is the annual repayment instalment if interest is charged at 20% p.a.

Solution

$$A = \frac{120,000 \ x \ 0.20}{1-(1.20)^{-10}} = N28,622.73.$$

2.08   Present Value of Uneven Cash Flow

Investments made by a firm do not frequently yield constant periodic cash flows. In most instances, the firm receives a stream of uneven cash flow. Thus, the present value factors for an annuity cannot be used. The procedure is to calculate the present value of each cash flow and aggregate all the present values. The following equation can be used to calculate the present value of uneven cash flows:

$$PV = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \frac{A_n}{(1+r)^n} = \sum \frac{A_t}{(1+r)^t}$$

t = 1, 2, ... n.

Illustration 12

Consider that an investor has an opportunity of receiving N10, 000, N15, 000, N8, 000, N11, 000 and N4, 000 respectively at the end of one through five years. Find out the present value of this stream of uneven cash flow, if the investors required interest rate is 8%

The present value is calculated as follows;

$$\text{Present value} = \frac{10,000}{(1.08)} + \frac{15,000}{(1.08)^2} + \frac{8,000}{(1.08)^3} + \frac{11,000}{(1.08)^4} + \frac{4,000}{(1.08)^5}$$

= 10,000 (0.926) + 15,000 (0.857) + 8,000 (0.794) + 11,000 (0.735) + 4,000 (0.681) = N39, 276

2.09   Perpetuities

Perpetuity is an annuity that occurs indefinitely. Perpetuities are uncommon in financial decision-making. One of the few examples can be seen in the case of irredeemable preference shares (i.e. preference shares without a maturity), by which the company is expected to pay presence dividend perpetually. By definition, in perpetuity, time period, n, is so large (mathematically n approaches infinity, ∞) that the expression (1+i) tend to become zero, and the formula for perpetuity simply becomes

Present value of a perpetuity   =   Perpetuity
                                                    Interest rate

However, there are two warnings about the perpetuity formula. First, at a glance, one can easily confuse the formula with the present value of a single payment. A payment of N1 at the end of one year has a present value of 1/ (1+r). The perpetuity has a value of 1/r. These are quite different.

Second, the perpetuity formula shows the value of a regular stream of payments starting one period from now. Thus, a N20 billion endowment would provide a Foundation with its first payment in one year's time. If one also wants to provide an up-front sum, he/she will need to lay out an extra N2billion.

To illustrate this, assuming that an investor expects a perpetual sum of N5, 000 annually from his investment. What is the present value of this perpetuity if the interest rate is 10 percent?

Present value of Perpetuity (p) = perpetuity/interest rate

$$i.e. P = \frac{₦5,000}{0.10} = ₦50,000$$

2.10   Risk and Uncertainty Analysis

Risks exist because of the inability of the decision maker to make perfect forecasts. A forecast cannot be made with perfection or certainty since the future events on which they depend are uncertain. An investment is not risky if we can specify a unique sequence of cash flow for it. But where the problem lies is that cash flow cannot be forecasted accurately.

A risk is associated with the variability of future returns of a project. The greater the variability of the expected returns the riskier the project. Risk can, however, be measured more precisely. The most common measures of risk are standard deviation and coefficient of variations

2.11   Probability Factor

Probability may be described as a measure of someone's opinion about the likelihood that an event will occur. If an event is certain to occur, we say that it has a probability of one of occurring. If an event is certain not to occur, we say that is the probability of its occurring is zero. Thus, probability of all events to occur lies between zero and one.

A probability distribution may consist of a number of estimates. But in the simple form, it may consist of only a few estimates. One commonly used form employs only the high, low and best guess estimates.

Illustration 13

The annual cash flow expected from a project together with the associated probabilities is tabulated below:

Assumption	Cash flow (N)	Probability
Best guess	400,000	0.2
High guess	240,000	0.6
Low guess	160,000	0.2

The forecast considers the chance or probability of the annual cash flows being either N400, 000 (maximum) or N160, 000 (minimum) at 20% each. There is a 60% probability that annual cash flows may be N240, 000. The additional information provided by the forecaster is useful in assessing more clearly the impact of a variable, which may assume different values on the profitability of an investment. This important question is how to obtain probability distributions

Objective Probability: The classical probability theory assumes that no statement whatsoever can be made about the probability in a very long-run sense, given that the occurrence or non-occurrence of the event can be repeatedly observed over a very long period of time under independent identical situations. The classical concept of objective probability is of little use in analysing investment decisions because these decisions are non-repetitive and hardly made under independent identical conditions over time. As a result, some people opine that it is not very useful to express the forecasters' estimates in terms of probability.

In recent years, probability is seen from personalistic view, which holds that it makes a great deal of sense to talk about the probability of a single event, in that reference can be made to the probability of rain tomorrow, the probability of sales reaching a certain level next quarter, or the probability that earning per share will exceed N2.50k next year, or five years hence. Such probability assignments that reflect the state of belief of a person rather than the objective evidence of a large number of trials are called personal or subjective probabilities.

Illustration 14

The followings are the five possible (A-E) net cash flows of project X and Y and their associated probabilities. Both projects have a discount rate of 10%.

			Project X	Project Y
	Cash flow (N)	Prob	Cash flow (N)	Prob.
A	8,000	0.10	24,000	0.10

B	10,000	0.20	20,000	0.15	
C	12,000	0.40	16,000	0.50	
D	14,000	0.20	12,000	0.15	
E	16,000	0.10	8,000	0.10	

Calculate the expected net present value for each project and indicate which project is preferable

Solution

Calculation of Expected value for project X and Project Y

	Project X			Project Y		
Possible event	net cash flow (N)	Prob.	Expected values (N)	Net cash flows (N)	Prob.	Expected Value
A	8000	0.10	800	24000	0.10	2400
B	10000	0.20	2000	20000	0.15	3000
C	12000	0.40	4800	16000	0.50	8000
D	14000	0.20	2800	12000	0.15	1800
E	16000	0.10	1600	8000	0.10	800
ENCF			12,000			16,000

It can be seen from the table above that project Y has a higher expected net cash flow i.e., N16, 000 and, therefore, would be preferable to project X which has an expected net cash flow of N12, 000. Project Y will also have a higher net present value when the expected net cash flows of the two projects are discounted at the same rate. If we assume a discounted rate of 10% and an equal initial cost of N5000 for each project at the given discount rate of 10%, the Net Present value for project X is 0.909x(N1200-N5000)=N6,363.

Project Y's NPV is (0.909*N16000-N5000)= N9,999

2.12   Decision Tree

A decision tree is also known as a probability tree. It is a diagrammatic representation of the alternatives involved in a problem requiring sequential decision so that all the possible alternatives could be properly evaluated. There are two nodes; the decision node and the chance node (also known as a state of nature node).

A decision node is usually used when the situation is under control, while the chance node is used when there is a probability situation.

Illustration 15

A student is contemplating whether to play scrabble or not. If he decides to play, he will toss a coin. He will continue to play if he has a head from the coin. Draw the decision tree.
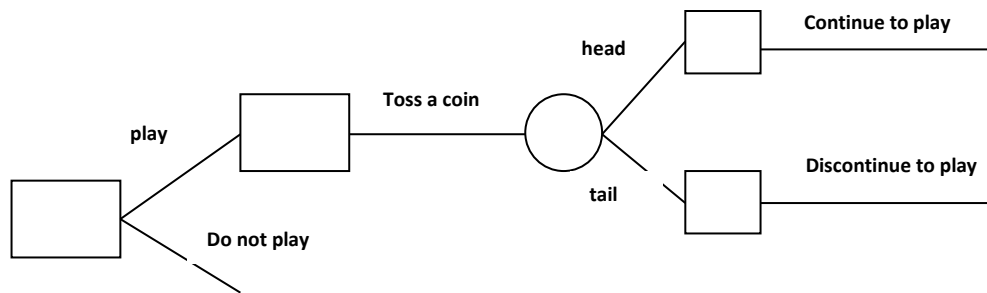
Circumstances where decisions are sequential and depend on previous decisions, decision tree provides a convenient method of analysis. Applying discounting to decision tree involves one extra stage in the calculation.

The steps involved in solving decision tree problems are as follows;

Step 1. Represent decision points and outcomes on a decision tree

Step2. Calculate the PV at each point.

Step3. Work backwards to decision points to evaluate the expected value of the decision alternatives at each point.

Illustration 16

Addis Ababa Plc is considering project D. It can invest either N1m or N1.5m in the project. If it invests N1m, it has 0.6 chance of receiving net cash flows of N300, 000 per annum for the following five years and 0.4 chance of receiving nothing. If it invests N1.5m, it has a 0.5 chance of receiving N230, 000 per annum in years 1 to 5 and also a 0.5 chance of receiving N330, 000 in the first year, in which case it has a choice of investing a further N1m or not to invest at the end of the first year.

If it invests a further N1m, its cash flows will be N600, 000 p.a. But if it does not, its cash flows will continue at N300, 000 p.a. for years 2-5. Assuming the cost of capital is 10%, you are required to advise the Directors of Addis Ababa PLC on what decision to make.

Solution
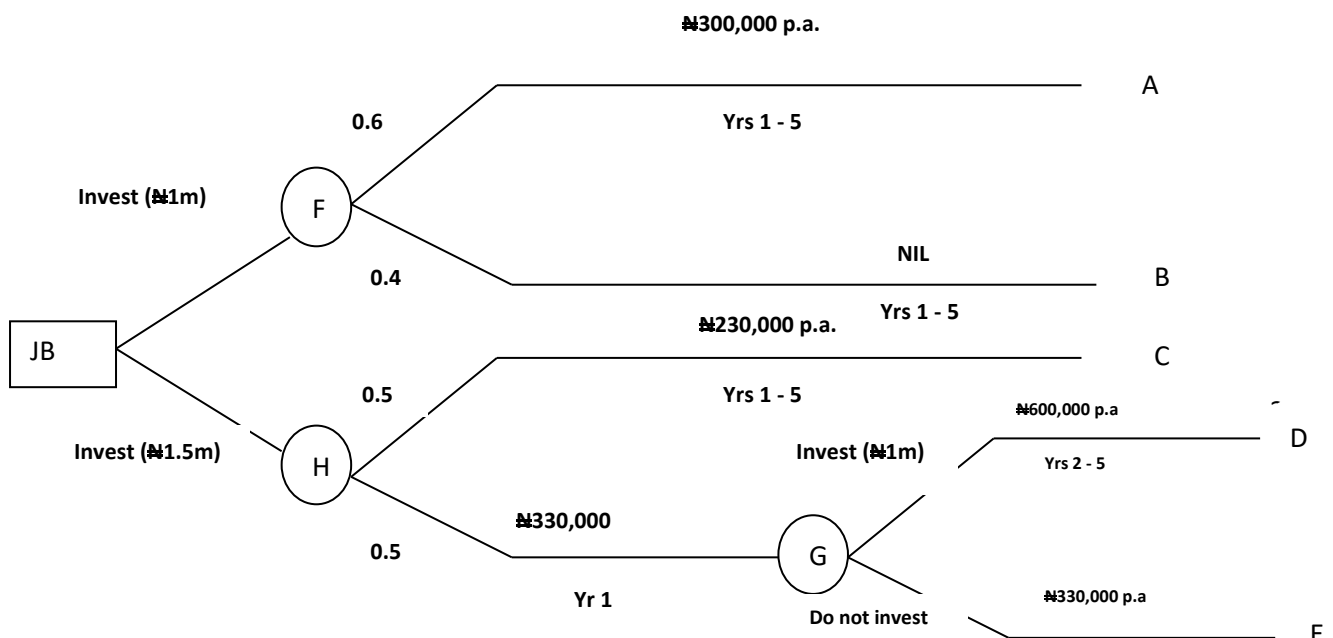
Node A

Yr.	CF N	DCF (10%)	PV N
0	(1,000,000)	1.00	(1,000,000)
1-5	300,000	3.7908	1,137,240
		NPV	137,240

Node B

Yr	CF N	DCF 10%	PV N
0	(1,000,000)	1	(1,000,000)
1-5	NIL	3.7908	NIL
		NPV	(1,000,000)

Node C

Yr	CF N	DCF 10%	PV N
0	(1,500,000)	1	(1,500,000)
1-5	230,000	3.7908	871,884
		NPV	628,116

Node D

Yr	CF N	DCF 10%	PV N
0	(1,000,000)	1	(1,000,000)
1	(1,000,000)	0.9091	(909,100)
1	300,000	0.9091	272,730
2-5	600,000	2.8817	1,729,020
		NPV	92,650

Node E

Yr	CF N	DCF 10%	PV N
0	(1,500,000)	1.00	(1,500,000)
2-5	300,000	2.8817	864,510

Node F

A and B will be combined to make F

A   137,240 x 0.6   82,344

B   (1,000,000) x 0.4   (400,000)

                                (317,656)

Node G

Between D and E apply the rule of the highest pay off to make G

D   92,650

E   137,240   864,510. E is selected (844,510) to make G.

NODE H

C and G will be combined to make H

C   (628,116) x 0.5   (314,058)

G   864,510 x   0.5   432,245

        (118,197)   to make H

NODE I

Between F and H, apply the rule of the highest payoff to make I

F   (317,656)   i.e. F (317,656)

H   (245,438) – 118,197 i.e. H (18197)

Decision: Since H is positive, the Directors are advised to invest 1.5m in the project with a positive NPV of N118, 197.

Techniques of Decision Theory

Managers make decisions in order to achieve corporate goals. They must, therefore, understand how good decisions can be reached and be familiar with important decision aids available to them. Good decisions are based on logic, all available data and all possible techniques. A rational decision process evaluates all possible alternatives in order to choose the alternative that best meets corporate objectives. Much skill is needed to be able to choose wisely among several alternatives.   A methodical approach to the decision process is then essential. One of such approaches is Decision Theory. Decisions easily amenable to the techniques of Decision Theory are characterized by:

   i   A set of possible future conditions that will have a bearing on the results of the decision.

   ii   A list of alternatives to be chosen from.

   iii A known payoff for each alternative.

Decision Theory Approach to Decision Making

Decision Theory approach to the decision process employs the following steps:

1. Develop a list of possible alternative causes of action available e.g. launch a new product: after a proper market survey, or without a market survey; build: a small plant, medium-sized plant, a large plant, etc.

2. Identify the possible future conditions known as States of Nature (chance events] likely   with the decision Alternative e. g Conditions of the economy: Boom, Stable, Depression or High Demand, Moderate Demand, Low Demand, etc.

3. Estimate the payoff associated with each alternative for every possible state of nature, e.g. X_1 = payoff if it is a large plant and the economy is booming, etc.

4. If possible, determine or estimate the likelihood (probability) of each possible state of nature e.g. P_i = probability that the economy is under the boom.

5. Evaluate each alternative course of action.

6. Select the alternative with the optimal result.

Therefore, a manager implementing the Decision Analysis procedure must adopt the following steps to reach his optimal decision:

1. Identify the decision problem.

2. Specify his decision objectives and the criteria for finding a solution.

3. Develop suitable alternative courses of action for his desired decision.

4. Evaluate each alternative using the appropriate decision criterion.

5. Select the optimal alternative.

6. Implement the solution.

7. Monitor the implementation to ensure that the problem is solved.

2.13   Decision Environment

Decision-making environments are formally classified into three categories according to the degree of certainty present.

1. Certainty Environment – in which all relevant parameters have known values.

2. Risk Environment – in which future events have probable outcomes which are

   mutually exclusive and collectively exhaustive so that sum of the probabilities = 1.00.

3. Uncertainty Environment – in which it is impossible to assess the probability of

various future events.

Examples of Differing Environments

1.   The selling price of a product is N200 per unit, 2000 units have been ordered. What will   total sales be? -Certainty Environment.

2.   Selling price is N200 per unit. Based on previous experience, the likelihood of selling

   all 2000 units is only 60%. Calculate expected sales -Risk Environment.

3.   Selling price is N200 per unit. We have available for sale 2000 units. We have no

    available likelihood of how many we can sell or the nature of potential demand. - Uncertainty Environment.

Decision Making under Certainty:

The decision maker knows exactly which of the possible future conditions will actually happen and what will be each alternative outcome.

Decision: Choose the alternative that has the best payoff under that state of nature.

Illustration 17

Three African markets: Nigeria, South Africa, Angola are being proposed by a company to launch its new ICT equipment. The choice of a market will depend on the highest estimated return in present value (Nm) given that due to imminent competition, the market will certainly experience low, or moderate, or high demand for the ICT equipment. The table below is the estimated 3-year returns (Nm) in each market according to whether low, moderate or high demand will be experienced.

The problem is to select one of the alternatives taking into account Present Value as given.

1.   Under Certainty

If we experience low demand, the Angolan market will be preferred (though a smaller market, it has a net return of N4m). If we know the demand will be moderate, we will launch the product in South Africa with a moderate sized market and a net return of N12m. If the potential demand is known to be high, the product will best be launched in Nigeria (a large market) with the net return of N20m.

2.   Decision Making under Risk

In decision making under risk, the probability of each state of nature is known. For example: in the problem of choice of where to launch the ICT equipment, (Prob. 2.1) analysts may have estimated probability of low demand = 0.25, moderate demand = 0.40 and high demand = 0.35 during the launch.

3. Expected Monetary Value Criterion

This is a widely accepted criterion for evaluating an alternative when the probabilities of possible outcomes are known and the decision maker is risk neutral (neither risk averse, nor risk seeking).

$EMV = \sum P_i X_i$,   where:

X_i = estimated outcome for the state of nature.

P_i = probability of occurrence of that state of nature.

Illustration 18

Using the Expected Monetary Value Criterion, identify the best alternative market to launch the ICT equipment. Use table below:

Table 2.2

Possible Future Demand

Alternatives	Low	Moderate	High
Angola	4	6	10
South Africa	2	12	18
Nigeria	-5	8	20
Probability	0.25	0.4	0.35

Evaluating the Alternatives

EMV [Angolan market]:   = 4 x 0.25 + 6 x 0.4 + 10 x 0.35   =   N6.9m

EMV [South African market]: = 2 x 0.25 + 12 x 0.4 + 18 x 0.35   =   N11.60m

EMV [Nigerian market]:   = -5 x 0.25 + 8 x 0.4 + 20 x 0.35   =   N8.95

Decision: The Company will choose to launch the product in South Africa since it has the highest EMV.

Decision Making Under Uncertainty

The decision maker has no information on the problem of the various states of nature. Four possible decision criteria are popular:

1.   Maximax Criterion – Choose the alternative with the best possible payoff. It is the optimistic criterion. The decision maker sets out the best outcome for each alternative. He selects the alternative with a maximum in the set of these best outcomes.

2.   Maximim Criterion – Determine the worst payoff for each alternative and choose the alternative with the "best" of the set of worst payoffs. It is essentially a pessimistic position in decision making.

3.   Laplace Criterion – Determine the Average payoff for each alternative, treating the states of nature as equally likely. Choose alternatives with the best of these averages.

4.   Minimax Regret Criterion – Determine regrets in payoffs for each state of nature in each alternative. Regret is obtained by subtracting every payoff in each state of nature from the best payoff in that state of nature. Notice the worst regret for each alternative. Choose the alternative with the "best" i.e. least "worst regrets".

Illustration 19

Using the payoff table (table 2.1), determine which alternative would be preferred under the following strategies:

     i.   Maximin Criterion

     ii.   Maximax

     iii.   Laplace Criterion

     iv.   Minimax Regret Criterion

Solution

(i). Under Maximim Criterion: the worst payoffs for each alternative are: Angola N4m, South

Africa N2m, and Nigeria N-5m. Since N4m is the best of the set of minima, choose to launch the product in Angola.

ii.   Using Maximax Criterion: Maximum outcomes are

Angola 10

South Africa 18;

Nigeria 20.

Decision: Launch the product in Nigeria with a Maximax of N20 million.

iii. **Under Laplace Criterion:**

Table 2.3

	Total Row Outcome	Row Average
	N m	N m
Angola	20	6.67
South Africa	32	10.67
Nigeria	23	7.67

Choose South Africa since it has the highest Average payoff.

iv. **Under Minimax Regret Approach:**

The table of regrets is as shown:

Table 2.4

	Regrets N m			
	Low	Moderate	High	Worst Regret
Angola	0	6	10	10
South Africa	2	0	2	2
Nigeria	9	4	0	9

The lowest regret is N2m which again occurs within the South African market.

2.15   Expected Value of Perfect Information

Though a decision maker may have the probabilities for a state of nature in his decision process, he may decide to delay the decision until it is clear which state of nature will occur (perfect information). If the state of nature when it occurs is favourable, the option can be exercised, if unfavourable, the option will be abandoned.

The question to determine is whether the cost of the option will be less than the expected gain due to delaying the decision i.e. whether the expected payoff under the situation of perfect information will be higher than the previously expected payoff under risk. The expected gain (if there is) is known as the Expected Value of Perfect Information, EVPI derived as:

EVPI = Expected Payoff under Certainty – Expected Payoff under Risk

To compute Expected Payoff under Certainty,

Identify the highest payoff under each state of nature.

Multiply this payoff by the corresponding probability of the nature and sum for all alternatives.

Illustration 20

Use table 2.2 to compute the Expected Value of Perfect Information in this decision problem.

Solution:

The highest payoffs are: low demand 4, med. demand 12, and high demand 20 with probabilities 0.25, 0.40, 0.35 respectively. Hence Expected Payoff under certainty is:

=   4 x 0.25 + (12 x 0.4) + 20 x 0.35

=   1.0   +   4.8   +   7.0

=   12.8

Expected Payoff under Risk = 11.60   (see example 2.2)

Therefore, EVPI   = N12.8m – N11.6   = N1.2m

We can also use the Expected Regret approach to obtain the EVPI. The method is to compute the table of expected regret for each alternative market and multiply by the corresponding probabilities of states of nature.

Illustration 21

Use the table of Expected regrets table 2.4 above to compute Expected Value of Perfect Information for the decision problem of example 2.1.

Solution

Table 2.5   Table of Regrets

	Low	Moderate	High
Angolan market	0	6	10
South African market	2	0	2
Nigerian market	9	4	0
Probability	0.25	0.4	0.35

Angolan market: 0.25(0) + 0.4(6) + 0.35(10)   =   5.9

South African market: 0.25(2) + 0.4(0) + 0.35(2)   =   1.2

Nigerian market: 0.25(9) + 0.4(4) + 0.35(0)   =   3.85

Hence, the lowest Expected regret is N1.2m which is associated with alternative 2 (South Africa) and agrees with the previous solution.

Hence, EVPI $=$ N1.2m.

Illustration 22

If DanJos is to collect N20,000 at the end of 7 years, and interest rate or opportunity cost of fund is 12% annually, calculate the value of the amount equated with the present.

$$PV = Fv(1+r)^{-n} = 20,000(1+0.12)^{-7}$$

$$= 20,000(1.12)^{-7}$$

$$= 20,000(0.4523)$$

$$= 9,046$$

Illustration 23

Lumumba deposited N10, 000 in a savings account at a nominal rate of 12% annual interest rate. Determine the future value at the end of 3 months?

Let m = number of times interest is paid annually

If interest rate is $^{r\%}/_4$ since 3 months is ¼ year

$$Fv = pv(1+ ^r/_m)^{mn}$$

$$Fv = 10,000(1+^{0.12}/_4)^{4 \times ¼}$$

$$= 10,000(1.03)$$

$$= 10,300$$

If Discount is 'm' times a year

$$PV = \frac{Fv}{(1+\dfrac{r}{m})^{mn}} \quad \text{or} \quad Fv(1+ ^r/_m)^{-mn}$$

$$PV = \frac{P1}{(1+r)} + \frac{P2}{(1+r)^2} + \frac{P3}{(1+r)^3}$$

Risk of Business

Illustration 24

Suppose Mr. JJ deposits N10,000 in a bank for a period of 5 years at the following rates

Year	1	2	3	4	5
Rate	10%	10%	12%	15%	15%

You are required to determine the balance in the account at the end of the period

Solution

$$Fv = 10,000 \, (1.1)^2 \, (1.12) \, (1.15)^2$$

$$= 10,000 \, (1.21) \, (1.12) \, (1.3225)$$

$$= N17,922.52$$

Note: The raise to power was as a result of the uniform rate in various years. For example, year 1 and 2 rates are the same, therefore they are combined.

Assuming the following is available:

Year	1	2	3	4	5
Rate	10%	15%	20%	13%	18%

Solution

$$Fv = 10,000 \, (1.1) \, (1.15) \, (1.2) \, (1.13) \, (1.18)$$

$$= N20241.01$$

Illustration 25

What compound rate of interest will be required to produce N500, 000 after 5 years with an initial investment of N400, 000?

$$Fv = P(1+r)^n$$

$$500,000 = 400,000(1+r)^5$$

$$(1+r)^5 = \frac{500,000}{400,000}$$

$$\sqrt[5]{(1+r)^5} = \sqrt[5]{5/4}$$

$$(1+r) = \sqrt[5]{1.25}$$

$$r = \sqrt[5]{1.25} - 1$$

$$r = 1.045639553 - 1$$

$$r = 0.0456$$

r   =   4.56%

Illustration 26

How long will it take for a given sum of money to double itself at 10% per annum interest rate?

Solution

Fv = $P(1+r)^n$

     = $P(1+1)^n$

$2P$ = $P(1+1)^n$

2 = $(1.1)^n$

$Log\ 2$ = $n\ log\ 1.1$

n = $\dfrac{Log\ 2}{Log\ 1.1}$

n = $\dfrac{0.3010}{0.0414}$

n = $7.27yrs$

Amortisation, Annuity and Sinking Fund

$$DCF\ =\ \frac{1-(1+r)^{-n}}{n}$$

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

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

Illustration 27

 ZEE Limited needs to repay a N500, 000 loans with bank XYZ over the next five years. The loan which is at an interest rate of 20% per annum shall be repaid in equal instalment.

You are required to:

   a. Calculate the amount of each instalment

b. Show the loan amortisation schedule.

Solution

r=20%   A = 500,000   n = 5

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

$$= \frac{500,000}{\left[1 - \frac{\left(\frac{1}{1+0.2}\right)^5}{0.2}\right]}$$

$$= \left[\frac{500,000}{\frac{1-0.4019}{0.2}}\right]$$

$$= \left[\frac{500,000}{\frac{0.5981}{0.2}}\right]$$

$$= \left[\frac{500,000}{0.5981} \times \frac{0.2}{1}\right]$$

$$= \left[\frac{100,000}{0.5981}\right]$$

=167,196 This value represents the annual instalments.

Zee Limited Loan Amortisation Schedule

Yr	Opening bal N	Interest N	Instalments N	Closing bal N
1	500,000	100,000	167,176	432,824
2	432,824	86,565	167,176	352,213
3	352,213	70,443	167,176	254,940
4	254,940	50,988	167,176	138,752
5	138,752	27,751	167,176	_____
			835,980	

835,980 – 500,000 = 335980

$$= \frac{335980}{500,000} = 67\%$$

The 67% represent the percentage of interest on N500, 000. It means that more than half of the money is being paid as interest.

Illustration 28

Suppose ZEE Limited needs N500, 000 to replace his fixed assets in 5yrs time, in order to generate the amount, the company set aside an equal amount of its profit which will be invested at the rate of 20% per annum. You are to determine the amount the company should set aside annually out of his profit and show the sinking fund schedule.

Solution

The sinking fund amount is computed thus, using the following formula.

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

$$= \frac{500,000}{\frac{(1+0.2)^5 - 1}{0.2}}$$

$$= \frac{500,000}{\frac{(1.2)^5 - 1}{0.2}}$$

$$= \quad \cfrac{500,000}{\cfrac{2.48832 - 1}{0.2}}$$

$$= \quad \left[\frac{500,000}{2.48832 - 1} \times \frac{0.2}{1} \right]$$

=   67,190

ZEE Limited Sinking Fund Schedule

Yr	Opening bal N	Interest N	Instalments N	Closing bal N
1	-	-	67,190	67,190
2	67,190	13,438	67,190	147,818
3	147,818	29,564	67,190	244,572
4	244,572	48,914	67,190	360,676
5	360,676	72,135	67,190	500,000

2.14   Review Questions

1.   A man invested ₦50, 000 at 15% S.I for 4 years. How much would his investment be worth at the end of the investment period? (5marks)

2.   If S.I on loans is increased from 15% to 21% per annum, what would be the increase in interest charged on a loan of ₦120, 000 for a period of 6 months? (5marks)

3.   A trader invested a certain sum of money at simple interest. If at the end of three years, the money amounted to ₦690.00 and at the end of 5 years to ₦750.00;

    Calculate:

    a.   The rate percent per annum. (5marks)

    b.   The original sum of money invested (5marks)

    c.   The number of years required for the original sum to double itself. (5marks)

4.   a.   A customer saved ₦37, 500 with a bank and at the end of the year,

        His money amounted to ₦39, 000. Calculate the rate of interest. (5marks)

    b.   Kofi borrowed ₦1, 250 from Bode and paid back ₦1, 606.25 at the end of 3 years. Calculate the rate percent per annum at which simple interest was charged(10marks)

5.   A dealer sold a car to a man and made a profit of 15%. The man then sold the car to a woman for ₦120, 175 at a loss of 5%. How much did the dealer buy the car.?(10marks)

6.   An Investor puts ₦300, 000 into a deposit Account which matures after two years at a rate of 20% per annum. What is the amount of the account at compound interest? (10marks)

7.   What would be the total value of an investment of ₦900, 000 made now for 5 years at 13% compound interest? (10marks)

8.   Calculate the amount on ₦200, 000 deposited into an Account paying 20% p.a for 4 years if interest is compounded quarterly. (10marks)

9.   What will be the value of the Investment in (8) above, if the Account paid 5% per quarter compounded? (10marks)

10.   A bank customer deposited ₦50, 000 into his account on December 31st 1998: the amount remained invested and on 31st December of each subsequent year, he deposited a further sum of ₦20, 000. Calculate his total investment worth as at December 31st 2004 if the bank compound interest rate is 15%. (15marks)

11.   If initial investment on December 31st 1997 was ₦100, 000 and on 31st December each subsequent year a further sum of ₦25, 000 was added to the investment. If the amount

remained invested till December 31st 2005, how much would be in that account as at that date if compound interest was 17% p.a. and is computed quarterly. (10marks)

12. An employee planning to retire has started a deposit scheme of ₦30, 000 at end of each year into an account paying annually for 20 years an annual rate of 15% p.a. Calculate the value of that account at the end of the 20 years period. (15marks).

13. Find the end value of an investment of ₦25, 000 made at the beginning of each year for 10 years into an account that pays 17% p.a. compounded semi-annually. (15marks)

14. a. How much would an investor deposit now at 13% p.a. to amount to

   ₦25, 000 at the end of 3 years? (5marks)

   b. Calculate the Present Value of annual cash flow of ₦100, 000 for 5 years discounted at 16% p.a. (5marks)

15. A Businessman is arranging a certain amount of loan at an interest rate of 21% per annum. The lender has offered the following terms: ₦2, 000 repaid at end of each quarter for 5 years. Ignoring other charges on the loan, calculate the size of the required loan. (15marks).

16. Find the PV of an Annuity of ₦200, 000 a year payable for 12 years at 4% per annum.

17. a. Find the yearly instalment of an annuity which amounts to ₦300, 000 in 12 years at 4% per annum. (10marks).

   b. Calculate the yearly instalment of an annuity payable for 12 years that can be purchased for an immediate payment of ₦300,000 interest being calculated at 4% p.a. (10marks).

18. A company issued 1,560 debenture stocks at ₦100 each payable at the end of the 10th year. What amount should be set aside every year and invested at 3½ % compound interest to enable the company repay the debenture at maturity? (10marks).

19. a. A bank loan of ₦1,000,000 which is contracted at 20% compound interest per annum for 5 years is to be repaid in half yearly equal instalments. How much will be the value of each instalment payment? (10marks).

   b. If I borrow ₦50,000 today at a compound interest rate of 15% p.a. and then arrange to pay N10,000 one year today, and the balance to be repaid three years today, how much would be the final repayment amount? (10marks).

20. a. A company has purchased a property with a 10-year term loan of ₦20 million which is to be repaid in quarterly instalment. How much is the quarterly instalment repayment if interest on the loan is 25% p.a.? (5marks)

   b. To be able to buy a house, Mr. Williams is planning to raise ₦1 million in 3 years by half-yearly installment bank deposit. How much will this installment deposit be if the bank pays interest at 12% p.a.? (10marks)

21. The table below indicates payoffs for Alternatives for building a store; A = small store, B = medium store, C = large store, where there will be a new bridge and where no bridge will be built in the area. (10marks)

Alternative capacity	New bridge built	No new bridge built
A = Small	1	14
B = Medium	2	10
C = Large	4	6

   a.   Assume the payoffs are profits ₦m, determine the alternative that would be chosen under the following criteria:
   i.   Maximin(5marks)
   ii.   Maximax(5marks)
   iii.   Laplace(5marks)
   b.   Using the information in the payoff table, develop a table of regrets, and then determine the alternative that would be chosen under minimax regrets. (10marks)
   c.   Determine the expected value of perfect information using the regret table assuming that the probability of a new bridge is 0.4.(10marks)

22   A firm wishes to add to its product line by building a small or large production facility. If it builds a small facility and demand is low, the Net Present Value is N4m. If demand is high, the firm can either maintain the small facility or expand it. Expansion would have an NPV of N4.5m, and maintaining the small facility would have an NPV of N0.5m. If a large facility is built and demand is high, the estimated NPV is N8m. If demand turns out to be low, the NPV will be (N0.1m). The probability that demand will be high is estimated to be 0.6; the probability that the demand will be low is estimated to be 0.4.

Required:

a.   Analyze the problem using a tree diagram. (10marks

b.   Using the expected Monetary Value Criterion, advice the firm owner which type of facility to build. (10marks)

c.   Compute the Expected Value of Perfect Information. How could this information be used? (10marks)

d.   Determine the range over which each alternative would be best in terms of the values of probability P_1 of low demand. (10marks)

23.   Chek Petroleum Plc 5 ½% First Mortgage Bond issued at N1,000 per value is currently selling at N665. But the 4 1/2 % First Mortgage Bond of Fredob Plc also issued at N1,000

par value is selling at N975. Indicate the number of factors that might explain the wide divergence in the prices of these two bonds(15marks)

MODULE 3

3.00   **INVESTMENT APPRAISAL**

3.01 Learning Outcomes
On successful completion of this module, students should be able to:

    i   Assess the opportunity of an Investment
    ii   Examine and apply the concept of Payback period, Accounting Rate of Return, Net Present Value and Internal Rate of Return.
    iii   Evaluate the limitation of various concepts
    iv   Calculate PBP, ARR, NPV, and IRR
    v   Appraise the Superiority of NPV over IRR
    vi   Analyse Exclusive Project with unequal life
    vii Review the concepts of Profitability Index
    viii Evaluate the Treatment of inflation in capital investment appraisal

3.02   Time Value of Money

Financial decisions recognize 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 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.

3.03   Identification of Relevant Cash Flows

Relevant cash flows can be examined in either a written or calculation format. It is also important that candidates can identify relevant cash flows in order to be able to use them in the context of investment appraisals, for example, net present value calculations. Finally, relevant cash flows are not just an important part of the syllabus for Paper FFM as they can also be examined in later studies, for example, Paper F9.

A definition often used for relevant cash flows states that they must be cash flows that occur in the future and are incremental.

    i   **Cash flow:** While on the face of it obvious, only costs or revenues that give rise to a cash flow should be included. Accordingly, for example, depreciation charges should be excluded.

    ii   **Future:** Any relevant cash flow should arise in the future. Anything that has occurred in the past is referred to as a sunk cost and should be excluded from relevant cash flows.

iii	**Incremental:** Only cash flows that arise because of the decision being made should be included; any cash flow that would have arisen anyway, sometimes referred to as a committed cost, should be excluded.
iv	**Opportunity cost:** While not specifically included in the definition of a relevant cash flow (as noted above) opportunity costs are also relevant cash flows. Opportunity costs are the revenues that are lost (or additional costs that arise) from moving existing resources from their current use and are therefore considered to be incremental cash flows arising in the future to be taken into account.

These definitions sound easy, and candidates often do well when relevant cash flows are examined in a written format. However, it is applying these concepts to a scenario and calculating/identifying the relevant cash flows that can often cause candidates problems, and it is this that I shall now focus on using excerpts from the question in Appendix 1 as examples where possible. Please read the question before continuing.

In the context of whether a business owner will move her business, we are told that 'Mrs Clip currently advertises her business in the local newspapers and business directories, at a cost of N1, 000 per year payable in advance. Mrs. Clip will carry on with this advertising.'

On a relevant cash flow basis, we do not need to be concerned with what has been paid in the past, so the N1, 000 per year paid in the past is a sunk cost and can be ignored from relevant cash flows.

What about the N1, 000 per year in the future if Mrs. Clip continues with the advertising? This would not be included as a relevant cash flow, because it is not incremental. The N1, 000 cash flow is being suffered now and will continue in the future, whether or not Mrs. Clip moves her business to the town centre premises. The cash flow does not arise because of the decision being made; it arises anyway and is therefore not a relevant cash flow.

A further example of the incremental concept relates to revenue. Revenue from the existing business is N40, 000 per year. We are told that if Mrs. Clip advertised her move to the town centre premises in the papers only, then revenue would increase by 40%, but if the move was advertised in both the papers and on the radio, then revenue would increase by 45% rather than 40%.

The existing revenue of N40, 000 is not incremental. This is the level of revenue that has been earned by the business in the past and will be earned in the future whether or not a move to the town centre premises is made. It is not dependent on the decision being made. In order to get the relevant cash flow, what is required is the incremental revenue – i.e. the extra revenue that will be earned if the move is made. Thus if the advertising is only in the papers, then the incremental revenue earned will be 40% x N40, 000 = N16, 000. If the advertising is in both the papers and on the radio, then the incremental revenue will be 45% x $40,000 = $18,000.

Within this question, there were no non-cash flows. However, what if we had been told that Mrs. Clip was going to buy salon fittings for N3, 000, and these would be depreciated over five years?

The N3, 000 paid for the salon fittings would be a relevant cash flow and incorporated within any relevant cash flow schedule at the time at which the fittings were purchased. However, depreciation is not a cash flow and is therefore not a relevant cash flow. As a result, it the annual depreciation charge should not be included within any relevant cash flow schedule.

Opportunity costs arise less frequently within questions, but when they do, they can cause candidates real problems. There are no opportunity costs within the question we have been considering, but let us look at an example all the same. An opportunity cost arises if a resource is moved from its current use. So let us say that we have labour that is currently being used in manufacturing process A. The following figures are available for manufacturing process A:

	N per unit
Sales revenue	25
Materials	10
Labour (2 hours @ $3 per hour)	6
Variable overhead	2
Contribution	7

Labour is now required for manufacturing process B within the same organisation. Each unit within manufacturing process B uses two hours of labour. No more labour can be hired and so it would have to be moved from manufacturing process A. What is the relevant cash flow for labour in process B?

Using our definition of a relevant cash flow to be a future, incremental cash flow, we can ignore the labour cost of N6 as it is not incremental; it will be paid anyway, either within process A or process B. However, if we move the labour from A to B, the organisation will have to forgo the sales revenue of N25 per unit, but they will not suffer the material cost of

N10 per unit or the variable cost of N2 per unit. Thus the net effect, the net cost of moving the labour to process B is (N25 – N10 – N2) = N13 per unit. This N13 is the opportunity cost, the net revenue lost from moving the labour from its current use. You may see a shortcut to this calculation – that of adding together the contribution loss of N7 to the labour cost of N6, the total again being N13 per unit. Although this seems theoretically incorrect, as the non-incremental labour cost of N6 is being included, it is just a shortcut to the answer.

3.04   Nature of Investment Decision

The following facts could be established about capital expenditure which is its characteristics.

     i   The cash outlays are often large.

    ii   The decision when taking is not easily reversible.

iii   The benefits are realized by the company over a long range of time.

iv   Calls for efficient and careful appraisal or alternative investment opportunities.

v   Because of the long-range cash flow benefits it is exposed to inflation.

Procedures for Investment Decision

The procedure involved in capital budgeting are as follows:

1.   Possible investments are identified a new market or a new product

2.   Identification of alternative projects like expansion, diversify etc.

3.   Acquire relevant data on the various projects.

4.   Select the best alternative, the best alternative is the project that increases the net present value of the firm. Implementation

5.   Appraise/evaluate the projects based on data collected

6.   Project monitoring and control to ensure forecast, and estimate in accordance with expectation.

Classification of capital investment projects

The various capital investment projects can be grouped into four broad categories, namely, (1) replacement of existing facilities, (2) expansion of the capacity of existing facilities, (3) expansion into new areas, and (4) others.

Replacement of existing facility

Where an existing asset wears out or is obsolete, it has to be replaced. Failure to effect the replacement will affect operational efficiency adversely. Replacement decisions appear to be the simplest to make. This is because you have a good idea of the cost savings and/or increase in revenue that will accrue if the replacement is effected, you can also quantify the consequences of non-replacement which could manifest in high production cost or low quality output. By matching the envisaged benefits that will accrue from the replacement with the cost of the replacement, you will arrive at a decision whose outcome will be highly predictable.

Expanding the capacity of the existing facility

Expanding existing capacity could take the form of adding more machines or equipment, etc. to the already in use. It could also take the form of opening another branch of an already existing line of business. An expansion could incorporate some replacement if the new asset is of a higher grade. To illustrate, an old machine could be replaced with another machine of the same capacity or efficiency. It could also be replaced with a bigger and more efficient machine. In this case, expansion and replacement are both involved. Unlike in the outright replacement with a machine of similar capacity, expansion decision is much more difficult

because of the problem of forecasting the revenue profile of the expanded capacity. Recourse could, however, be had on the study of past production and sales experience of similar machines or facilities elsewhere.

Expansion into new areas and others

Expansion into new area involves investing in a completely new area of business. This is more difficult because of the absence of experience data on which to base the decision. Estimates of future revenue profile are normally used but such estimates are at best mere approximations.

3.05   Methods of Investment Appraisal

The different projects competing for the limited resources of the firm will have to be ranked in order to acceptability. The ranking involves estimating the future benefits that will accrue from each of the competing projects and then converting the benefits into a ranking measure. This is the subject of investment appraisal.

There are various methods of investment appraisal. The methods can be grouped into two broad categories, namely, non-discounted cash flow techniques and discounted cash flow techniques.

The **non-discounted** cash flow techniques include:

i   Payback method

ii   Accounting rate of return method

iii   The discounted cash flow techniques include:

iv   Net present value (NPV)

v   Internal rate of return (IRR)

These different techniques and methods require different information for application. They could also lead to different conclusions. This raises the question as to the most appropriate method in any given situation. We shall discuss the methods one after the other.

3.06   Payback Period

Some firms require that the initial investment in any project should be recovered within a specified cut-off period, called the payback period. In essence, the payback period is the number of years it will take to recover the original investment from the cash flows of the project. Here the emphasis is on how rapidly the project will pay back its initial investment and not on the overall profitability of the project.

This attitude can be rationalized. The reasoning is that investment in any project involves tying up of money, and since money tied up cannot be reused, there is a risk that the money could be permanently lost, giving the fact that the risk of non-recovery increases with the distance in future. With the above in mind, management decides on an appropriate cut-off period for assessing the viability of projects. The cut-off period is usually fixed by intuition.

Advantages of Payback Period

The following advantages are claimed for the payback period.

1. It is easy to calculate. It is also easy to understand and apply.

2. It is particularly useful to firms in weal cash and credit position. Such firms understandably lay more emphasis on quick recovery of invested funds so that the recovered funds can be reused.

3. It is desirable where accuracy in an estimate of overall profitability is not sought for.

4. It is suitable where the proposed project is very risky. This is defended on the ground that returns beyond three to four years are fraught with much greater uncertainty.

5. It is commended because projects with faster payback period have a favourable effect on earnings per share.

6. It can be established that empirically, it produces a satisfactory result.

Disadvantages of Payback Period

Although the payback period has some advantages, it should not be used blindly. This is because it could lead to a wrong decision.

Two major weaknesses of the method can be identified.

1. Disregard of Income beyond Payback Period: The payback period favours projects with early maturity. It is true that returns accruing after about three to four years may be shrouded in uncertainty, there is, however, no economic justification for their total exclusion. Some judgement of the likelihood of their occurrence ought to be attempted instead of outrightly ignoring them. Outright disregard of all post payback returns implies assigning zero probability to their occurrence which is not correct.

2. Failure to take Account of Time Value of Money: The second major weakness of the payback period is its failure to take account of the time value of money. That is, it does not recognize that a naira today is worth more than a naira to be received after one year. This is because the naira received today can be invested to earn interest at the prevailing rate by the end of the year.

Illustration 1

Consider a project with the following information

Cost N100, 000 Residual value after 5 years Nil

Yr.	1	2	3	4	5
	N	N	N	N	N
Profit	20,000	30,000	40,000	50,000	60,000

After depreciation:

Determine the number of years it takes the project to pay back.

Solution

No name

Determination of payback period.

Yr.	Profit after Depreciation		Depreciation	CF	Outstanding
	N		N	N	N
0	(100,000)				
1	20,000	+	20,000	40,000	(100,000)
2	30,000	+	20,000	50,000	(60,000)
3	40,000	+	20,000	60,000	(10,000)
4	50,000	+	20,000	70,000	
5	60,000	+	20,000	80,000	

Working

i. Depreciation = Cost – Salvage Value   = 100,000 – 0 =20,000

                         5   5

            10,000 x 12 = 2months

             60,000   = 2years + 2months

3.07   Accounting Rate of Return

This is based on return on investment and that is given as:

ARR = $\dfrac{\text{Average annual profit} \times 100}{\text{Average investment}}$

Where average annual profit = Average annual profit after taxation and depreciation scrap;

Average investment = $\dfrac{\text{initial layout value}}{2}$

Decision criteria = If the computed ARR is greater than the company's predetermined rate of return, the project should be selected; otherwise, the project should be dropped. Where two mutually exclusive projects are involved, the one with larger ARR is selected.

Advantages

    a. Simple to use

    b. Easy to understand

    c. Considers the total profit of a project throughout its lifespan.

Disadvantages

    a. Ignores the time value of money

    b. Uses the profit rate than cash flow which is subjective

    c. It does not measure absolute gain

Illustration 2

A company is considering 2 projects as follows.

Project	A	B
Cost	₦100,000	₦150,000
Life of project	4 yrs	4yrs
Residual Value	₦5,000	₦15,000

Estimated future profit before depreciation and tax

Yr	A	B
1	₦35,000	₦150,000
2	₦50,000	₦50,000
3	₦56,000	₦60,000
4	₦60,000	₦80,000

Assuming straight-line depreciation and 30% taxation rate, which project should the company select, Note: the company's target: rate of return is 20%.

Solution

Evaluation of project A & B using ARR

Project A

Cost N100,000

Residual value   =   ₦5,000

Net depreciation   =   ₦95,000

Total profit = 35 + 50 + 56 + 60 = 201

Profit after depreciation = 201,000 – 95,000 = 106,000

Tax at the rate of 30% = 106,000 x 0.30 = 31,800

        106,000

        (31,800)

        74,200

Average annual profit = 74,200

                4   = 18,550

Average outlay = I + Scrap value

                2

       = 100,000 + 5,000

           2   = ₦52,500

ARR = 18,550 X 100 = 0.3533

      52,500   = 35.33%

Project B

Cost =   150,000   life span 4 years

Residual value 15,000

Net depreciation   135,000

Total profit   340,000

Profit after depreciation	135,000
	205,000
Tax at 30%	61,500
	143,500

Average profit <u>143,500</u>

$$\frac{}{4} = 35,875$$

Average out lay <u>150,000 + 15,000</u>

$$\frac{}{2}$$

ARR = <u>35,875</u> = <u>0.4348</u> or 43.5%

82,500

Decision

From the foregoing computation of ARR of the projects A and B, it is advisable to go for project B because it has larger ARR of 43.3%

3.08   Net Present Value

Net Present Value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of a projected investment or project.

The following is the formula for calculating NPV:

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

Where:

C_t = net cash inflow during the period t

C_o = total initial investment costs

r = discount rate, and

t = number of time periods

A positive net present value indicates that the projected earnings generated by a project or investment (in present dollars) exceed the anticipated costs (also in present dollars). Generally, an investment with a positive NPV will be a profitable one and one with a negative

NPV will result in a net loss. This concept is the basis for the Net Present Value Rule, which dictates that the only investments that should be made are those with positive NPV values.

When the investment in question is an acquisition or a merger, one might also use the Discounted Cash Flow (DCF) metric.

Apart from the formula itself, the net present value can often be calculated using tables, spreadsheets such as Microsoft Excel or Investopedia's own NPV calculator.

BREAKING DOWN 'Net Present Value - NPV'

Determining the value of a project is challenging because there are different ways to measure the value of future cash flows. Because of the time value of money (TVM), money in the present is worth more than the same amount in the future. This is both because of earnings that could potentially be made using the money during the intervening time and because of inflation. In other words, a dollar earned in the future won't be worth as much as one earned in the present.

The discount rate element of the NPV formula is a way to account for this. Companies may often have different ways of identifying the discount rate. Common methods for determining the discount rate include using the expected return of other investment choices with a similar level of risk (rates of return investors will expect), or the costs associated with borrowing money needed to finance the project.

For example, if a retail clothing business wants to purchase an existing store, it would first estimate the future cash flows that store would generate, and then discount those cash flows (r) into one lump-sum present value amount of, say #500,000. If the owner of the store were willing to sell his or her business for less than #500,000, the purchasing company would likely accept the offer as it presents a positive NPV investment. If the owner agreed to sell the store for #300,000, then the investment represents a #200,000 net gain (#500,000 - #300,000) during the calculated investment period. This #200,000, or the net gain of an investment, is called the investment's intrinsic value. Conversely, if the owner would not sell for less than #500,000, the purchaser would not buy the store, as the acquisition would present a negative NPV at that time and would, therefore, reduce the overall value of the larger clothing company.

Let's look at how this example fits into the formula above. The lump-sum present value of #500,000 represents the part of the formula between the equal sign and the minus sign. The amount the retail clothing business pays for the store represents C_o. Subtract C_o from #500,000 to get the NPV: if C_o is less than #500,000, the resulting NPV is positive; if C_o is more than #500,000, the NPV is negative and is not a profitable investment.

Drawbacks and Alternatives

One primary issue with gauging an investment's profitability with NPV is that NPV relies heavily upon multiple assumptions and estimates, so there can be substantial room for error.

Estimated factors include investment costs, discount rate, and projected returns. A project may often require unforeseen expenditures to get off the ground or may require additional expenditure at the project's end.

Additionally, discount rates and cash inflow estimates may not inherently account for risk associated with the project and may assume the maximum possible cash inflows over an investment period. This may occur as a means of artificially increasing investor confidence. As such, these factors may need to be adjusted to account for unexpected costs or losses or for overly optimistic cash inflow projections.

Payback period is one popular metric that is frequently used as an alternative to net present value. It is much simpler than NPV, mainly gauging the time required after an investment to recoup the initial costs of that investment. Unlike NPV, the payback period (or "payback method") fails to account for the time value of money. For this reason, payback periods calculated for longer investments have a greater potential for inaccuracy, as they encompass more time during which inflation may occur and skew projected earnings and, thus, the real payback period as well.

Moreover, the payback period is strictly limited to the amount of time required to earn back initial investment costs. As such, it also fails to account for the profitability of an investment after that investment has reached the end of its payback period. It is possible that the investment's rate of return could subsequently experience a sharp drop, a sharp increase or anything in between. Comparisons of investments' payback periods, then, will not necessarily yield an accurate portrayal of the profitability of those investments.

Internal rate of return (IRR) is another metric commonly used as an NPV alternative. Calculations of IRR rely on the same formula as NPV does, except with slight adjustments. IRR calculations assume a neutral NPV (a value of zero) and one instead solves for the discount rate. The discount rate of an investment when NPV is zero is the investment's IRR, essentially representing the projected rate of growth for that investment. Because IRR is necessarily annual – it refers to projected returns on a yearly basis – it allows for the simplified comparison of a wide variety of types and lengths of investments.

For example, IRR could be used to compare the anticipated profitability of a 3-year investment with that of a 10-year investment because it appears as an annualized figure. If both have an IRR of 18%, then the investments are in certain respects comparable, in spite of the difference in duration. Yet, the same is not true for net present value. Unlike IRR, NPV exists as a single value applying the entirety of a projected investment period. If the investment period is longer than one year, NPV will not account for the rate of earnings in way allowing for easy comparison. Returning to the previous example, the 10-year investment could have a higher NPV than will the 3-year investment, but this is not necessarily helpful information, as the former is over three times as long as the latter, and there is a substantial amount of investment opportunity in the 7 years' difference between the two investments.

Interested in more information on Net Present Value? See: Time Value of Money: Determining Your Future Worth and our Introduction To Corporate Valuation Methods. For more on the

relationship between NPV, IRR, and associated terms, see the section of our Guide to Corporate Finance called "Net Present Value and Internal Rate of Return."

3.09   Adjusted Present Value
What is an 'Adjusted Present Value - APV'

The adjusted present value is the net present value (NPV) of a project or company if financed solely by equity plus the present value (PV) of any financing benefits, which are the additional effects of debt. By taking into account financing benefits, APV includes tax shields such as those provided by deductible interest.

BREAKING DOWN 'Adjusted Present Value - APV'
To calculate the adjusted present value is to first calculate the NPV of the project or company without debt. Then, the NPV is adjusted to include the benefits of financing. Main benefits of this approach are often tax shields resulting from one or more tax deductions of interest payments or a subsidized loan at below-market rates. Leveraged buyout situations are the most effective situations in which to use the adjusted present value methodology.

Calculating Adjusted Present Value

While the adjusted present value method is similar to the discounted cash flow methodology, adjusted present cash flow does not capture taxes or other financing effects in a weighted average cost of capital (WACC) or other adjusted discount rate. Unlike WACC used in discounted cash flow, adjusted present value seeks to value the effects of the cost of equity and cost of debt separately. In essence, the adjusted present value equals:

Adjusted Present Value = Base-case net present value + net present value of all financing side effects

In practice, the adjusted present value is not used as much as the discounted cash flow method. It is more of an academic calculation but is often considered to result in more accurate valuations.

Along with the initial NPV estimate, three other variables must be calculated. The first, which is widely considered the most important side effect of financing, is the interest tax shield (ITS). The ITS is created when companies have debt because the interest on the debt is tax-deductible. The ITS is calculated as:

ITS = Interest Expense x Tax Rate

The next component is the ITS Used. Because not all of the ITS must be used in a given year and can be carried forward, the ITS Used is calculated as:

ITS Used = minimum (ITS, taxes)

Lastly, the terminal value (TV) of the ITS is calculated. The formula for this is TV ITS = t x Debt x Re x (1 + g) / (Re - g) ^ 2, where

t = tax rate

Debt = terminal year debt balance

Re = required return on equity

g = terminal growth rate

In a financial projection where a base-case NPV is calculated, the sum of the present value of the ITS Used and the TV ITS are added to obtain the adjusted present value. For example, assume a multi-year projection calculation finds the present value of a firm's free cash flow plus terminal value is N230, 700. If the present value of the ITS Used is N10, 000 and present value of the TV ITS is N6, 000, then the adjusted present value is:

Adjusted Present Value = #230,700 + #10,000 + 6,000 = #246,700

3.10   Internal Rate of Return

Internal rate of return (IRR) is a metric used in capital budgeting measuring the profitability of potential investments. Internal rate of return is a discount rate that makes the net present value (NPV) of all cash flows from a particular project equal to zero. IRR calculations rely on the same formula as NPV does.

The following is the formula for calculating NPV:

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

Where:

C_t = net cash inflow during the period t

C_o = total initial investment costs

r = discount rate, and

t = number of time periods

To calculate IRR using the formula, one would set NPV equal to zero and solve for the discount rate r, which is here the IRR. Because of the nature of the formula, however, IRR cannot be calculated analytically, and must instead be calculated either through trial-and-error or using software programmed to calculate IRR.

Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project. IRR is uniform for investments of varying types and, as such, IRR can be used to rank multiple prospective projects a firm is considering on a relatively even basis. Assuming the costs of investment are equal among the various projects, the project with the highest IRR would probably be considered the best and undertaken first.

IRR is sometimes referred to as "economic rate of return" (ERR).

BREAKING DOWN 'Internal Rate of Return - IRR'

You can think of IRR as the rate of growth a project is expected to generate. While the actual rate of return that a given project ends up generating will often differ from its estimated IRR rate, a project with a substantially higher IRR value than other available options would still provide a much better chance of strong growth. One popular use of IRR is in comparing the profitability of establishing new operations with that of expanding old ones. For example, an energy company may use IRR in deciding whether to open a new power plant or to renovate and expand a previously existing one. While both projects are likely to add value to the company, it is likely that one will be the more logical decision as prescribed by IRR.

In theory, any project with an IRR greater than its cost of capital is a profitable one, and thus it is in a company's interest to undertake such projects. In planning investment projects, firms will often establish a required rate of return (RRR) to determine the minimum acceptable return percentage that the investment in question must earn in order to be worthwhile. Any project with an IRR that exceeds the RRR will likely be deemed a profitable one, although companies will not necessarily pursue a project on this basis alone. Rather, they will likely pursue projects with the highest difference between IRR and RRR, as chances are these will be the most profitable.

IRRs can also be compared against prevailing rates of return in the securities market. If a firm can't find any projects with IRRs greater than the returns that can be generated in the financial markets, it may simply choose to invest its retained earnings in the market.

Although IRR is an appealing metric to many, it should always be used in conjunction with NPV for a clearer picture of the value represented by a potential project a firm may undertake.

Issues with 'Internal Rate of Return (IRR)'

While IRR is a very popular metric in estimating a project's profitability, it can be misleading if used alone. Depending on the initial investment costs, a project may have a low IRR but a high NPV, meaning that while the pace at which the company sees returns on that project may be slow, the project may also be adding a great deal of overall value to the company.

A similar issue arises when using IRR to compare projects of different lengths. For example, a project of a short duration may have a high IRR, making it appear to be an excellent investment, but may also have a low NPV. Conversely, a longer project may have a low IRR,

earning returns slowly and steadily, but may add a large amount of value to the company over time.

Another issue with IRR is not one strictly inherent to the metric itself, but rather to a common misuse of IRR. People may assume that, when positive cash flows are generated during the course of a project (not at the end), the money will be reinvested at the project's rate of return. This can rarely be the case. Rather, when positive cash flows are reinvested, it will be at a rate that resembles the cost of capital more. Miscalculating using IRR in this way may lead to the belief that a project is more profitable than it actually is in reality. This, along with the fact that long projects with fluctuating cash flows may have multiple distinct IRR values, has prompted the use of another metric called modified internal rate of return (MIRR). MIRR adjusts the IRR to correct these issues, incorporating cost of capital as the rate at which cash flows are reinvested, and existing as a single value. Because of MIRR's correction of the former issue of IRR, a project's MIRR will often be significantly lower than the same project's IRR. (For more, see: Internal Rate of Return: An Inside Look.)

3.11   Lease or Buy Decisions

The make-or-buy decision is the act of making a strategic choice between producing an item internally (in-house) or buying it externally (from an outside supplier). The buy side of the decision also is referred to as outsourcing. Make-or-buy decisions usually arise when a firm that has developed a product or part—or significantly modified a product or part—is having trouble with current suppliers, or has diminishing capacity or changing demand.

Make-or-buy analysis is conducted at the strategic and operational level. Obviously, the strategic level is the more long-range of the two. Variables considered at the strategic level include analysis of the future, as well as the current environment. Issues like government regulation, competing firms, and market trends all have a strategic impact on the make-or-buy decision. Of course, firms should make items that reinforce or are in-line with their core competencies. These are areas in which the firm is strongest and which give the firm a competitive advantage.

The increased existence of firms that utilize the concept of lean manufacturing has prompted an increase in outsourcing. Manufacturers are tending to purchase subassemblies rather than piece parts, and are outsourcing activities ranging from logistics to administrative services. In their 2003 book World Class Supply Management, David Burt, Donald Dobler, and Stephen Starling present a rule of thumb for out-sourcing. It prescribes that a firm outsource all items that do not fit one of the following three categories: (1) the item is critical to the success of the product, including customer perception of important product attributes; (2) the item requires specialized design and manufacturing skills or equipment, and the number of capable and reliable suppliers is extremely limited; and (3) the item fits well within the firm's core competencies, or within those the firm must develop to fulfil future plans. Items that fit less than one of these three categories are considered strategic in nature and should be produced internally if at all possible.

Make-or-buy decisions also occur at the operational level. Analysis in separate texts by Burt, Dobler, and Starling, as well as Joel Wisner, G. Keong Leong, and Keah-Choon Tan, suggest these considerations that favour making a part in-house:

i   Cost considerations (less expensive to make the part)
ii   Desire to integrate plant operations
iii   Productive use of excess plant capacity to help absorb fixed overhead (using existing idle capacity)
iv   Need to exert direct control over production and/or quality
v   Better quality control
vi   Design secrecy is required to protect proprietary technology
vii   Unreliable suppliers
viii   No competent suppliers
ix   Desire to maintain a stable workforce (in periods of declining sales)
x   Quantity too small to interest a supplier
xi   Control of lead time, transportation, and warehousing costs
xii   Greater assurance of continual supply
xiii   Provision of a second source
xiv   Political, social or environmental reasons (union pressure)
xv   Emotion (e.g., pride)

Factors that may influence firms to buy a part externally include:

i   Lack of expertise
ii   Suppliers' research and specialized know-how exceeds that of the buyer
iii   Cost considerations (less expensive to buy the item)
iv   Small-volume requirements
v   Limited production facilities or insufficient capacity
vi   Desire to maintain a multiple-source policy
vii   Indirect managerial control considerations
viii   Procurement and inventory considerations
ix   Brand preference
x   Item not essential to the firm's strategy

The two most important factors to consider in a make-or-buy decision are cost and the availability of production capacity. Burt, Dobler, and Starling warn that "no other factor is subject to more varied interpretation and to greater misunderstanding" Cost considerations should include all relevant costs and be long-term in nature. Obviously, the buying firm will compare production and purchase costs. Burt, Dobler, and Starling provide the major elements included in this comparison. Elements of the "make" analysis include:

i   Incremental inventory-carrying costs
ii   Direct labor costs
iii   Incremental factory overhead costs
iv   Delivered purchased material costs
v   Incremental managerial costs

    vi   Any follow-on costs stemming from quality and related problems
    vii Incremental purchasing costs
    viii Incremental capital costs

Cost considerations for the "buy" analysis include:

    i   Purchase price of the part
    ii   Transportation costs
    iii   Receiving and inspection costs
    iv   Incremental purchasing costs
    v   Any follow-on costs related to quality or service
    vi   One will note that six of the costs to consider are incremental. By definition, incremental costs would not be incurred if the part were purchased from an outside source. If a firm does not currently have the capacity to make the part, incremental costs will include variable costs plus the full portion of fixed overhead allocable to the part's manufacture. If the firm has excess capacity that can be used to produce the part in question, only the variable overhead caused by the production of the parts are considered incremental. That is, fixed costs, under conditions of sufficient idle capacity, are not incremental and should not be considered as part of the cost to make the part.

While cost is seldom the only criterion used in a make-or-buy decision, a simple break-even analysis can be an effective way to quickly surmise the cost implications within a decision. Suppose that a firm can purchase equipment for in-house use for N250,000 and produce the needed parts for N10 each. Alternatively, a supplier could produce and ship the part for N15 each. Ignoring the cost of negotiating a contract with the supplier, the simple break-even point could easily be computed:

N250,000	+	N10Q	=	N15Q
N250,000	=	N15Q	−	N10Q
N250,000		=		N5Q
50,000		=		Q

Therefore, it would be more cost effective for a firm to buy the part if demand is less than 50,000 units, and make the part if demand exceeds 50,000 units. However, if the firm had enough idle capacity to produce the parts, the fixed cost of N250,000 would not be incurred (meaning it is not an incremental cost), making the prospect of making the part too cost efficient to ignore.

Firms have started to realize the importance of the make-or-buy decision to overall manufacturing strategy and the implication it can have for employment levels, asset levels, and core competencies. In response to this, some firms have adopted total cost of ownership (TCO) procedures for incorporating non-price considerations into the make-or-buy decision.

3.12   Capital Budgeting and Inflation

Inflation is the general increase in the price of goods and services. It affects the cost of capital and the cash flow of the project under investigation.

Real and Money Cash Flows

Cash flow that is yet to be adjusted for inflation is Real or Current cash flow. Cash flow already adjusted for inflation is known as Money cash flow or nominal: Money cash flow = real cf (1 + inf)

MCF = RCF (1 + I) where I is the inflation rate

e.g. N10, 000 (1 + 0.1) = N11, 000 or MCF = RCF $(1 + i)^t$

i = the inflation rate.

Real and Money COC

Cost of capital that has taken inflation into consideration is the money cost of capital. Cost of capital without inflation consideration is the real cost of capital.

1 + km = (1 + kr) (1 + I)

Where km = money cost of capital

   Kr = real cost of capital

   I = inflation rate

E.g. if RC = 10%, inflation = 5%

Mc = (1+ 0.1) (1 + 0.5) = 1.1 x 1.05 = 1.155

1.155 – 1 = 0.155

15.5%

3.13 Inflation and Investment Appraisal

1. Assumes that the CF and discounts rate given are in money terms except otherwise informed.

2. Where specific rates are given, adjust the relevant CF to bring to money terms.

3. Where specific and general inflation rate are given, only specific rate should be used.

4. General inflation rate should only be used to adjust the COC where it is real or current term.

Illustration 3

Adon Ltd is considering a project costing N80, 000. The project is expected to have a life of 4years with a residual value of N2000. The project involves the manufacture and sales of product A. the selling price and variable cost per unit of product are expected to be N20 and

N10 respectively. In year one expected annual inflation rate is 5% and 8% respectively. Annual fixed cost is expected to be N8000 in 1 and rising by 6% because of 4000 units. The general rate of inflation is expected to be 10%, while COC is 18%.

Advice the company whether the project is viable

ADON Ltd

Appraisal of feasibility of project

Yr.	SP	Adjusted Sp	VC	Adjusted	VC	Contribution
1	20	20	10	10		10
2	20(1.05)	21	10(1.08)	10.8		10.2
3	$20(1.05)^2$	22.05	10(1.08) 2	11.66		10.39
4	$20(1.05)^3$	23.15	$10(1.08)^3$	12.6		10.55

Yr.	Cf	Units Prod	Total Sales	Fc
1	10	4000	40,000	8000
2	10.2	4000	40,800	8480
3	10.39	4000	41560	8989
4	10.55	4000	42,200	9528

Working of FC

FC	Adjust FC		Yr.
1	$8000(1.06)^0$		8000
2	$8000(1.06)^1$		8450
3	$8000(1.06)^2$		8988
4	$8000(1.06)^3$		9528

Yr.	I.O	Contri	Fc	NCF	DF 18%
0	(80,000)	-	-	(80,000)	0.
1	40,000	(8000)	8,000	32000	0.8475
2	40,800	(8480)	8,450	32,320	0.7182
3	41,560	(8989)	8,988	32320	0.6086
4	2000	42,200	(9528)	32,672	0.5157

Yr.	PV
0	(80,000)
1	27,120
2	23,212
3	19,670
4	16,848
	6,851

Advice – the company should embark on the project because it has positive NPV of N6, 851.

3.14 Capital Budgeting and Taxation

Tax affects capital budgeting in the following ways:

i.   The net cash profit from the project is subject to tax

ii.   The capital asset used attracts capital allowance (or written down allowance or tax allowance (tax relief).

NOTE

a. Tax is payable one year in arrears. This should be assumed except otherwise informed.

b. Capital allowance is claimed in the form of initial and balancing allowance.

c. Tax saving/relief on capital allowance is claimed one-year in arrears.

d. Investment in working capital does not attract tax relief.

Illustration 4

Jolak Ltd is considering a project costing N5m with a lifespan of 5years and estimated residual value of N10, 000. The project which involves the production and sale of product J, has the following information:

Year	1	2	3	4	5
	N	N	N	N	N
Sales qty units:	100,000	110,000	120,000	120,000	125,000
Fixed cost (N'000)	1,000	1,100	1,250	1,250	1,300

The selling price of product J is expected to be N50 per unit in year 1 rising by 5% per annum because of inflation. Variable costs are expected to be N25 per unit in year 1 rising by 8% per annum because of inflation. The general level of inflation in the country is currently 7.5%. Jolak Ltd can claim capital allowance at the rate of 20% on the reducing balance basis on the project. Tax is currently at the rate of 35% payable one year in arrears. If the company's after-tax COC is 7%, should the company invest in the project?

Solution

JOLAK Ltd

Appraisal of Project Using NPV with Consideration for Inflation

Year	1	2	3	4	5
Sales Price	50	50(1.05)	$50(1.05)^2$	$50(1.05)^3$	$50(1.05)^4$
	50	52.5	55.13	57.88	60.78
Qty Sold	100,000	110,000	120,000	120,000	125,000
Sales Revenue	5,000,000	5,775,000	6,615,600	6,945,600	7,597,500
V C Per unit	25	25(1.08)	$25(1.08)^2$	$25(1.08)^3$	$25(1.08)^4$
	25	27	29.16	31.49	34
	x	x	x	x	x
Qty Sold	100,000	110,000	120,000	120,000	125,000
TVC (N)	2,500000	2,970,000	3,499,200	3,778,800	42,500,000
Contribution(N)	2,500,000	2,805,000	3,116,400	3,166,800	3,347,500
Less FC (N)	(1,000,000)	(1100, 000)	(1250000)	(1250, 000)	(1300, 000)
Net Profit(N)	1,500,000	1,705,000	1,866,400	1,916,800	2,047,500
Tax @ 30% (N)	-	(450,000)	(511,500)	(559,920)	(575,040)
Tax Saving(N)		300,000	240,000	153,600	122,880
	N1500,000	N 1,555000	N 1,594,900	N 1,510,480	1,595,340

The net profit after tax ought to be discounted at Cost of Capital 7% using NPV to make a decision whether to invest or not.

Work 1: tax saving on capital allowance

Cost = N5,000,000

Yr.   Cost   Tax Saving

0   5,000,000

1. CA   5,000,000 x 20% = 1,000,000 x .3 = 300,000

2. CA   5,000,000 – 1,000,000 x 20% = 800,000 x .3 = 240,000

3. CA   5,000,000 – 1800,000 x 20% = 640,000 x .3 = 192,000

4. CA   5,000,000 – 2,440,000 x 20 = 512,000 x.3 = 153600

5. CA   5,000,000 – 2,952,000 x 20% = 409,600 x .3 = 122880

Note how to obtain the balancing allowance.

3.15   Capital Budgeting and Rationing

Definition

Capital rationing occurs when a firm is unable to accept all projects which are apparently profitable because of limited amount of funds.

Types of Rationing

   a. External/Hard rationing: The overall limitation placed on the availability of fund in the economy as a whole which may be done to government policy, imperfect capital market, banks, landing restructure.

   b. Internal/Soft capital rationing: which is an imposed limitation by the management of a company

   c. Single period capital rationing: where ration is limited to only one period, funds are available in next period

   d. Multi-period rationing: where limitation of capital extends over numbers of period

Project selection under capital rationing: These can be divided into two

   i.   Where projects are divisible, the method of selection is by Profitability Index of each project.

PI =   NPV   –   Evaluation of NPV per initial output

   ii.   Where the project is not divisible, critical and error combination of different projects is done with the combination with higher NPV in aggregate selected.

Illustration 5

Lagos Water Corporation working with a capital constraint of N7m is trying to decide which of a variety of new locations to install its in-water works. The list of possible locations is:

Location	A (N000)	B (N000)	C (N000)	D (N000)	E (N000)
Investment	1000	2400	3200	2200	1800
NPV	600	1800	2000	3000	2000

What is the most optimal way of spending the N7m assuming?

    a. Projects are divisible and B and C are mutually exclusive

    b. Projects are not divisible.

Lagos State Water Corporation

Evaluation of optimal ways of spending the limited fund of 7m

Project	NPV N	I.O N	Profitability N	Index	Ranking
A	600	1000	600 1000	.6	5th
B	1800	2400	1800 2400	.75	3rd
C	2000	3200	2000 3200	.625	4th
D	3000	2200	3000 2200	1.36	1st
E	2000	1800	2000 1800	1.11	2nd

Project Selection Assume It Divisible

	Project 1	Return		Option 2	Return
Project	I.O				
D	2200	3000		D 2200	3000
E	1800	2000		E 1800	2000
B	2400	1800		C 3000	1875
					6875
A	600	360	3,000 x		2,000
	7,000	7,160	3,200		1

$$\frac{600 \times 600}{1000} = 360$$

The corporation should embark on project A, B, D, and E to get a return of N7160

II Project Not Divisible

Contribution   Total Invest   Total NPV

	N	N
A, B, C	6,600	4400
C,D	5400	5000
D, E, B	6400	6800
C, D, A	6400	6000

The best combination is DEB giving a total NPV of N6800.

Financing options for capital budget

A financial manager must find the most economical method of financing a capital project. Common methods identified include:

1. Borrow to buy

2. Lease the machine by paying a lease rental

3. Hire purchase

4. Sales and leaseback

Capital Budgeting

It is the commitment of financial resources of an organization (to capital budget) with the expectation of earning future benefits over a reasonable long period in the future. It is also known as capital investment decision. The Capital Budgeting Process involves the following steps:

i Identification of possible investment project

ii Identification of alternative project

iii Acquisition of relevant data on the various project

iv Project appraisal based on data collected

v Selection of best alternative

vi Project implementation

vii Project monitoring and control

Capital Investment Projects can be:

i. Capital investment for maintenance of market position – existing product, market.

ii. Capital investment for safety and environmental consideration

iii. Capital investment for new product and diversification

iv.   Capital investment for public consideration /consumption

Illustration 6

A company is considering 2 projects as follows.

Project	A	B
Cost	N 100,000	N 150,000
Life of project	4yrs	4yrs
Residual Value	N 5000	N 15,000

Estimated future profit before depreciation and tax

Yr	A	B
1	N35,000	N150,000
2	N50,000	N50,000
3	N56,000	N60,000
4	N60, 000	N80,000

Assuming straight-line depreciation and 30% taxation rate, which project should the company select, Note: the company's target rate of return is 20%?

Solution
Evaluation of projects A & B using ARR
Project A
Cost = N100, 000
Residual value   =   5000
Net depreciation   95,000
Total profit = 35 + 50 + 56 + 60 = 201
   Profit after depreciation = 201,000 – 95,000 = 106,000
Tax at the rate of 30% = 106,000 x 0.30 = 31,800

$$\begin{array}{r} 106,000 \\ (31,800) \\ \hline 74,200 \end{array}$$

Average annual profit = $\dfrac{74,200}{4}$ = 18550

Average outlay = $\dfrac{I_o + \text{Scrap value}}{2}$

= $\dfrac{100,000 + 5000}{2}$ = N 52,500

ARR = $\underline{18550}$ x $\underline{100}$ = 0.3533

<div style="display:flex;justify-content:space-between">52500   1   = 35.33%</div>

Project B

Cost =   150,000   life span 4 years

Residual value = <u>15,000</u>

Net depreciation   135,000

Total profit	=	340,000
Profit after depreciation	=	<u>135,000</u>
		205,000
Tax at 30%	=	<u>61,500</u>
		143,500
Average profit	=	<u>145,500</u>
		4 = 35,875
Average out lay	=	<u>150,000 + 15,000</u>
		2

$$ARR = \frac{35,875}{82,500} = 0.4348 \text{ or } 43.5\%$$

Decision

From the foregoing computation of ARR of the projects A and B, it is advisable to go for project B because it has larger ARR of 43.3%.

Discounted Cash Flow Technique: Net Present Value – it evaluates a project by finding the NPV. NPV is obtained by discounting all future cash inflows from the capital investment project at a chosen Cost of Capital or discount rate and subtracting the initial cost of the project.

NPV is found using a schedule format. NPV makes use of only relevant cash flows that would arise only as a result of embarking on the project. Relevant costs include; future cash flow, revenue, and expenses from the project, government grants on the project, scrap value of an asset, opportunity cost/benefit, tax receipt/payment, the initial cost of investments. Schedule format is as shown:

Yr.	Cash Flow	Discount Factor	Present Value

Relevant costs also include working capital cost, incremental cost, cash saving, and contribution incremental fixed cost.

Irrelevant costs include – sales cost, committed cost, non-cash cost, allocated cost, interest on loan or appropriated cost.

Decision Criteria: Projects with positive NPVs should be embarked upon while the ones with negative NPVs should be discarded. Project with higher positive NPV should be selected between 2 projects.

Advantages

1. Considers the time value of the money

2. It is an absolute measure of returns

3. It is based on cash flows, not profit

4. Considers the whole life of a project

Disadvantages

1. It is difficult to explain and understand

2. It requires cost of capital.

Abandonment Value Consideration

Thus far, we have assumed that the proposed project will be kept throughout its economic life. The possibility of the project being abandoned midstream has not been brought into our analysis. We shall now bring in the possibility of abandoning the project sometime before the end of its useful life if things do not go according to our projections. To do this, we have to obtain the abandonment value of the project at any stage of its proposed useful life. The abandonment value is the amount which the project will realize if it is liquidated before its useful life.

The abandonment value (which in fact is the auction) at the end of each of the years of the project's economic life is treated as part of the cash flow of the year in question. Then we compute the net present value of the project as if it were to be abandoned (1) after the first year (2) after the second year, (3) after the third year, (4) and for other years in the project's useful life. The year of abandonment which gives the highest net present value is the best time to abandon the project.

The abandonment principle is useful in two important respects. First, at the initial evaluation of the project, it reveals the length of time the project will be pursued to maximize the net present value. Second, with respect to an ongoing project, it helps to determine the most beneficial time to abandon the project.

Introducing abandonment value in our analysis could produce if the equipment is replaced, the costs to be incurred are:

1. ₦1,550,000 trade – in cost
2. ₦1,500,000 p.a. being the reduced annual operating cost.

The benefit is the ₦150,000 disposal value at the end of 5 years.

We sketch the cash flows as follows:

0	1	2	3	4	5
₦1,500,000	₦1,500,000	₦1,500,000	₦1,500,000	₦1,500,000	₦1,500,000
					₦1,500,000
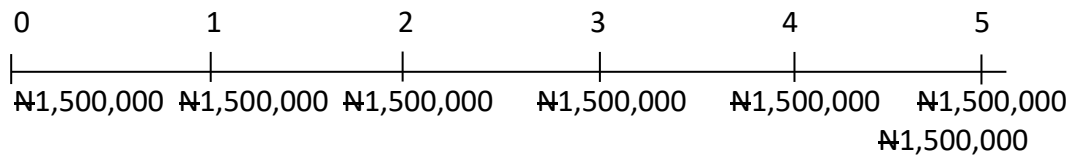
We obtain the NPV of Replacement as follows:

Year	Cash flows	Discount Factor At 14%	PV
	₦		₦
1	-1,500,000	0.877	-1,315,500
2	-1,500,000	0.769	-1,153,500
3	-1,500,000	0.675	-1,012,500
4	-1,500,000	0.592	- 888,000
5	-1,350,000	0.519	- 700,650
			₦5,070,150

NPV	=	PV of cash flows	-	Initial cost
	=	-N5,070,150	-	N1,550,000
	=	-N6,620,150		

Summary	₦
If equipment is kept, we spend	7,040,900
If equipment is replaced, we spend	6,620,150
Difference in favour of replacement	₦420,750

Recommendation
The equipment should be replaced.

Illustration 7

Davex Ltd is considering the replacement of its old machine with a new efficient one. The old machine would currently be sold for N105, 000 in the open market and has a net book value of N180, 000; the machine still has a residual value of N60, 000. The new machine will cost N720, 000 and is expected to generate annual cost saving of N180, 000 p.a for the next 5 years and will have a salvage value of N40, 000. The company required rate of return is 14%.

You are required to advise the company whether or not to replace the asset using NPV criteria and also calculate the projects payback period in discounted terms.

Solution

Davex Ltd

Appraisal of the replacement decision using NPV

Cost	=	N720, 000
Disposal of old machine	=	105,000
Net investment saving	=	720,000 – 105,000 = 615,000

Annual cash saving   =   N180, 000

Cost of capital   =   14%

Yr.	Cf	Df	P.V.	Outstanding
	N	14%	N	N
0	(615,000)	1.00	(615,000)	(615,000)
1	180,000	0.8771	157,878	(457,122)
2	180,000	0.7694	138,492	(318,630)
3	180,000	0.6749	121,482	(197,148)
4	180,000	0.5920	106,560	(90,588)
5	180,000	0.5193	93,474	2,882
5	40,000 0.	5193	20,772	23,660

PBB = 4years and $\dfrac{90,588}{93,474}$ = 11 months

Advise: The Company should embark on the project because of positive NVP of N23, 660.

Illustration 8

Mid Chad Engineering Plc is contemplating the disposal of one of its machine purchased 3 years ago for N5,000,000. Another company has offered to buy the machine as second hand now at N2,500,000. The management of Mid Chad considers this offer a rare opportunity which must not be missed. The machine will last for another 3 years. Mid Chad's minimum desired rate of return is 16 percent. The accountant's revenue profile for the machine for the next 3 years is shown below:

	Year1	Year 2	Year 3
	N	N	N
Revenue	1,681,500	2,062,500	1,500,000
Less (1) Variable cost	562,500	682,500	500,000
(2) Allocation of			
Fixed cost	375,000	460,000	335,000
(3) Depreciation	1,000,000	1,000,000	-
	1,937,500	2,142,500	835,000
Profit/Loss	-256,000	-80,000	+ 665,000

The accountant contends that since the depreciation rate was N1,000,000 in the past 3 years, the accumulated depreciation is N3,000,000 and that the book value of the machine is N2,000,000 (that is, N5,000,000 – N3,000,000). He therefore reported that if the machine is sold now, the profit on disposal will be N500,000 calculated as follows:

Profit on disposal	=	Proceeds of sale – Book of machine
	=	N2,500,000 - N2,000,000
	=	N500,000

On the basis of these calculations, the accountant recommended that the machine should be sold as priced. Should management accept this recommendation?

Solution

Let us first consider the nature of the profit upon which the accountant is relying. First, the accountant profit as arrived at after deducting fixed charges. Remember that fixed charges are already incurred and will continue to be incurred whether the project is scrapped or retained. Second, the accountant deducted annual depreciation charge. But depreciation is merely an accounting allocation of cost at the time the machine was bought. But the fixed charges and depreciation are strictly irrelevant in the determination of the cash flows of the machine.

We shall, therefore, determine the relevant cash flows for the evaluation of the machine project by disregarding the annual fixed cost charges and annual depreciation as follows:

	Year1 ₦	Year 2 ₦	Year 3 ₦
Revenue	1,681,500	2,062,500	1,500,000
Less Variable cost	562,500	682,500	500,000
Cash flow	₦1,125,000	₦1,375,000	₦1,000,000

With the relevant cash flows, we obtain the net present value of the machine project as follows:

Year	Cash flows ₦	Discount factor At 16%	PV ₦
1	1,125,000	0.862	969,750
2	1,375,000	0.743	1,021,625
3	1,000,000	0.641	641,000
			₦2,632,375

NPV of machine = PV of cash - Proceeds from proposed Sale of old machine

       =   N2,632,375   -   N2,500,000

       =   N132,375

Recommendation

Since retaining the machine produced a positive net present value, the machine should be retained against the accountant's advice.

Projects of Unequal Lives

Sometimes mutually exclusive projects of unequal lives are assessed. The inequality of the estimated economic lives of the projects makes comparison problematic. The basic principles

are that some common basis of economic life must be found to make comparison meaningful. There are three approaches. The first is to adopt the useful life of the shorter live project and assume that the life of the longer-lived project will be terminated. This means that the longer-lived project will be disposed of at the end of the useful life of the shorter-lived project.

The second approach is to adopt the useful life of the longer-lived project as the common life for comparison. Here we have to estimate the replacement value of the shorter-lived project and recycle it to terminate at the end of the useful life of the longer-lived project. The third and more common approach is to select a terminal date that will be common to both projects. This is achieved by extending the lives of the longer- and shorter-lived projects to the lowest common multiple of their estimated lives. For example, if the shorter-lived project has 3 years useful life and the longer-lived project has 5 years useful life, the common terminal date will be 15 years which is the lowest common multiple of the useful lives of both projects. This means that the shorter-lived project will be recycled five times while the longer-lived project will be recycled three times. In the recycling, some assumptions will have to be made about the reinvestment rate of return. One approach is to assume that reinvestment will be in an identical project. That is, the project will be repeated. The second approach is to assume that the project will be reinvested to earn only the firm's cost of capital. This means reinvesting at the project's internal rate of return when there will be neither profit nor loss. The first approach looks more rational hence its popularity.

Illustration 9
Bex Super Stores Ltd is presented with two options in its distributorship contract with Nigerian Breweries Plc, brewers of the popular Harp Beer. The first contract option is for a down payment of N400,000 for one year's supply of beer. The company estimates that the one-year consignment will be sold for N500,000. The alternative contract requires a down payment of N600,000 for 3 years supply of beer. If this option is accepted the company expects to earn an annual revenue of N265,000 for each of the 3 years from sales. Which of the options is more attractive if the firm's cost of capital is 8 percent?

Solution
Let us first of all sketch the cash flow profile of the two options:

Distributorship alternative A:

```
0                    1
├────────────────────┤
- N400,000    + N500,00
```

Distributorship Alternative B

```
0              1              2              3
├──────────────┼──────────────┼──────────────┤
-N600,000    +N265,000    +N265,000    + N265,000
```
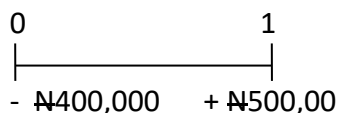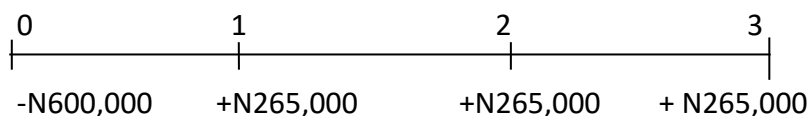
Before going to the actual solution, let us first evaluate the two alternatives as they are without taking into account their uneven lives and see how the results will look like.

We calculate the NPV of Alternative A as follows:

Year	Cash flow	Discount factor At 8%	PV
	N		N
0	-400,000	1	-400,000
1	+500,000	0.926	+463,000
		NPV	+N63,000

We also calculate the NPV of Alternative B as follows:

Year	Cash flow	Discount factor At 8%	PV
	N		N
0	-600,000	1	-600,000
1	+265,000	0.926	+245,000
2	+265,000	0.857	+227,105
3	+265,000	0.794	+210,410
		NPV	+N82,000

Without taking into account the uneven lives of the two alternatives, alternative B looks more attractive because it has a higher NPV.

We now go into the actual solution of the problem. Here, we have to consider that the shorter-lived alternative A could be recycled so that the two projects will operate for a common period. The lowest common multiple of their lives, that is 1 year and 3 years, is 3 years. We, therefore, assume that the shorter-lived alternative A will be renewed for three consecutive times. Consequently, the new cash flow profile of alternative A will be as follows:

```
0              1              2              3
|──────────────|──────────────|──────────────|

-N400,000  +N500,000    + N500,000    + N500,000
           -N400,000    - N400,000
```

Year	Cash flow	Discount factor At 8%	PV
	N		N

0	-400,000	1	-400,000
1	+100,000	0.926	+92,000
2	+100,000	0.857	+85,700
3	+500,000	0.794	+397,000
		NPV	+N175,300

The NPV of alternative B as earlier calculated is N82,905, while that of the recycled alternative A is N175,300. Alternative A is therefore preferable. This conclusion is at variance with what the result was when the uneven lives of the two projects were not taken into account.

The internal rate of return: This method appraises a project by finding the IRR which is the rate of return that gives a zero NPV on a project. It is found by interpolation when cash inflows are not constant.

Steps 1 – Find the positive NPV of the project at a given rate.

Step 2 – Find the negative NPV of the project at a given rate

Step 3 – Interpolate using the formula

$$IRR = Lr + \frac{NPV}{NPV + NPV -} \times (Hr - Lr)$$

Where:

Lr = the lower rate used and will give the positive NPV

Hr = the higher rate used and will give negative NPV

ii.   **IRR by use of annuity tables:**

The IRR when Annual Cash Flows are constant.

Recall that

$$NPV = \sum_{i=1}^{n} \frac{A_i}{(1 + r)^i} - I_o$$

Where

Ai = Annual Cash flows for i = 1, 2 … n years

Io = Initial Outlay

$$\frac{1}{(1 + r)^i} = \text{Discount Factor}$$

r = Discount rate

For Constant Annual Cash Flows,

$$NPV = \sum_{i=1}^{n} \frac{A}{(1+r)^i} - I_o$$

i.e.

$$NPV = A\left(\sum_{i=1}^{n} \frac{1}{(1+r)^i}\right) - I_o \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1)$$

If r is the Discount rate, and for NPV = 0, then equation (1) becomes

$$0 = A\left(\sum_{i=1}^{n} \frac{1}{(1+r)^i}\right) = I_o$$

$$\therefore \sum_{i=1}^{n} \frac{1}{(1+r)^i} = \frac{I_o}{A}$$

Io = Initial outlay

A = Annual cash inflow

$$\sum_{i=1}^{n} \frac{1}{(1+r)^i} = \text{Present Value}$$

Factor of an Annuity at r% Discount rate for n years.

The Section

$$\sum_{i=1}^{n} \frac{1}{(1+r)^i} = \text{can be read from the financial tables for n years at r\% p. a.}$$

Illustration: 10

Determine the Internal Rate of Return of a project with an Initial Outlay of N100, 000 resulting in annual cash flows of N15, 000 for 10 years.

Solution

A= N15, 000, Io = 100,000

$$\therefore \frac{I_o}{A} = \frac{100,000}{15,000} = 6.67$$

From the tables at r = 12%, n = 14 years

And

$$\sum_{i=1}^{14} \frac{1}{(1.12)^{14}} = 6.628.$$

The IRR is therefore 12%. The slight difference between 6.67 and 6.62 as calculated can be resolved in order to determine the exact value of 'r'. (See 6.67 – 6.62 = 0.05) as below:

$$\therefore \frac{0.05}{6.62} \times 12 = 0.09$$

$\therefore$ r = 12.09%.

Decision Criteria

A project should be selected if it has an IRR greater than COC. For two projects the one with the higher IRR is selected given it is higher than the COC.

Advantages

1. Considers the time value of money

2. Has cash flow instead of profit

3. It is a percentage

4. It is easy to understand

Disadvantages

1. This is not a measure of absolute profitability

2. Interpolation on estimate

3. Fairly complex

4. Can give rise to multiple IRR where there are irregular cash flows.

Illustration 11

The following information relates to a proposed project.

Cost of project = N1, 050,000, Scrap value Nil.

Cash inflow per annum N240, 000

Working capital requirement

At inception N30, 000

After one year N30, 000

The expected life of the project is 6years and the company's cost of capital = 18%

Requirement:

Show whether or not a project should be accepted using both NPV and IRR criteria.

Solution:

Appraisal of Project Using NPV & IRR

Yr.	Cf	Wc	Net Cf	Df 18%	Pv
0	(1,050,000)	(30,000)	(1,080,000)	1.00	(1,080,000)
1	240,000	(30,000)	210,000	0.8474	177,945
2	240,000		240,000	0.7182	172,368
3	240,000		240,000	0.6086	146,064
4	240,000		240,000	0.5157	123,768
5	240,000		240,000	0.4371	104,904
6	240,000	60,000	300,000	0.3704	111,120

NPV = ___-243,822___

Using IRR

Yr.	NCF	Df 9%	Pv
0	(108,000)	1.00	(1,080,000)
1	210,000	0.9174	192,654
2	240,000	0.8416	202,984
3	240,000	0.7722	185,328
4	240,000	0.7084	170,016
5	240,000	0.6499	155,976
6	360,000	0.5996	179,880

5,838

IRR = Lr + NPV x (HR - LR)

      NPV + NPV −

    9 + $\dfrac{5838}{5838 + 243822}$ x (18 − 9)

    9 + $\dfrac{5838}{249660}$ x 9

9 + (0.02338) x 9 = 9 + 0.21045

= 9.2104

Comment: Since the project has negative NPV at cost of capital of 18%, the project should not be accepted.

3.16   Review Questions

1.   What are the arguments in favour of the application of the payback period method of project appraisal?(10marks)

2.   Define accounting rate of return. How is it applied in project evaluation?(10marks)

3.   It is true that accounting rate of return recognizes profitability as an important factor in an investment decision. It, however, has its own defects. What are the defects?(10marks)

4.   How is the net present value rule applied in investment appraisal?(10marks)

5.   The internal rate of return in the rate of interest which make the net present value equal to zero. Discuss.10marks)

6.   Ahim Samboo Engineering Plc has two milling machines, an older one and a newer one. Both machines perform the same functions and differ only as to age. As a result of improvement in product engineering, the company is in a position to sell one of the machines. The newer machine could be sold today for N350,000. Its operating cost is N140,000 a year, but in 5 years, the machine will require a major overhaul that will be N210,000 a year until the machine is scrapped for N35,000 in 10 years.

The older machine if sold today will fetch N175,000. But if it is kept, it will need an immediate overhaul for N140,000 after which the operating cost will be N210, 000 a year until it is scraped in 5 years for N35,000. Both machines are fully depreciated for tax purposes. The cash flows have been forecasted in real terms. The real cost of capital is 12 percent. Tax rate is 35 percent. Which machine should the company sell? Explain the assumptions underlying your answer.(15marks)

7.   Sataomi holdings Ltd has just paid N2,100,000 for a new construction equipment that will last for 6 years and no residual value. At a management seminar attended by the chairman and chief executive officer of the company, a professor of accounting adamantly stated: "Not using accelerated depression for tax purposes is outright financial stupidity." The chairman who has a perpetual fear of rising income tax has all the time favoured straight line depression to have greater deduction against future income when taxes are higher. He is now reconsidering his position against the professor's remark at the seminar. He has therefore requested you to prepare a financial analysis in naira benefits using sum of digits depreciation instead of straight line depreciation under the following assumption: income tax rate of 60 percents for the for the first 3 years and 80 percent for the subsequent 3 years.(15marks)

8.   Suppose you have the underlisted investment opportunities but have only N30,000 available for spending. If your cost of capital is 10 percent, which projects would you take?(10marks)

Project	Initial Investment	Total PV	Profitability index	NPV
	N	N		N
A	18,000	25,000	1.4	7,200
B	9,000	12,150	1.35	3,150
C	6,000	7,800	1.30	1,800
D	6,000	7,680	1.28	1,680
E	3,000	3,000	1.00	-

9.   Jim-Bosy Plc imposed a ceiling of N5million on its capital expenditure. The firm's cost of capital is 11 percent. Below is a list of available projects and their relevant data.

Project	Cost N(000)	NPV N(000)	IRR (%)
A	1,500	330	17.2
B	1,000	20	10.7
C	1,250	215	16.6
D	500	70	12.1
E	500	35	11.8
F	1,750	315	18.0
G	2,000	240	13.5

Which projects should the firm select? How much does this artificially imposed ceiling cost the firm in terms of its market value?(10marks)

10.   The following projects with relevant data are available to Sani-samy Plc in the current year:

Project	Investment required N	IRR(%)	Life(year)	Annual cash flow N
A	840,000	25	8	252,378
B	140,000	22	5	48,882
C	28,000	20	6	8,418
D	112,000	18	4	41,636
E	420,000	16	5	128,283
F	560,000	14	3	241,171
G	280,000	12	5	77,670
H	140,000	10	2	80,646

The firm's cost of capital is 14 percent. Which projects should the firm select if:
    a.   There is no capital rationing?(10marks)

b.   Capital budget is limited at (i) N560,000 (ii) N700,000 (iii) N840,000? (10marks)

MODULE 4

4.00   **PORTFOLIO THEORY**

4.01   Learning Outcomes
On successful completion of this module, students should be able to:

    i   Differentiate between avoidable and unavoidable components of risk

    ii   Examine the significance of diversification of investment

    iii Evaluate the relationship between project (correlation)

    iv Calculate the return and risk of a two asset and three asset portfolio

    v   Apply systematic and unsystematic in practical financial management problem

    vi Analyse the relationship between capital asset pricing model and arbitrage pricing model.

4.02   Concept of Portfolio Theory

A theory is the systematic or scientific presentation of facts. Portfolio theory, therefore, can be defined as the way and manner in which a portfolio is selected with the aim of reducing, eliminating or decreasing the risk in the given portfolio. A portfolio is a collection of various investments that make up an investor's total investment. It is a combination of two or more assets (securities) ordinary share. A portfolio must consist of at least two different investments or securities.

Portfolio theory also known as Co-variance approach helps to select the combination of securities portfolio which gives the highest returns for minimum risk involved. The theory seeks to maintain returns on investments while reducing the risks involved. The business world is based on uncertainty, the investor is vulnerable to negative shocks if he/she relies on a single source of income, it stands to reason and less risky to have diverse sources of income or to put it another way, to hold a portfolio of assets or investments. The theory discourages the investor investing his resources or committing his resources just in one asset. It brings out the sense in an adage which says "you should not put your whole eggs in one basket".

The theory, therefore, brings out the 3-R(s) to look for in an investment analysis:

    i   Returns

    ii   Risks

    iii Relationship between the components of the portfolio.

There must be more than one investment before it could be addressed as a portfolio. The theory examines these 3Rs in the context of investment or securities (Shares in companies) or projects.

It is a scientific explanation of the relationship between risk, return, and correlation in the combination of 2 or more individual assets for the purpose of evaluation of the portfolio.

4.03   Relationship between Portfolio Risk and Return

A portfolio is the total collection of all investments held by an individual or institution, including stocks, bonds, real estate, options, futures, and alternative investments, such as gold or limited partnerships.

Most portfolios are diversified to protect against the risk of single securities or class of securities. Hence, portfolio analysis consists of analysing the portfolio as a whole rather than relying exclusively on security analysis, which is the analysis of specific types of securities. While the risk-return profile of a security depends mostly on the security itself, the risk-return profile of a portfolio depends not only on the component securities, but also on their mixture or allocation, and on their degree of correlation.

As with securities, the objective of a portfolio may be for capital gains or for income, or a mixture of both. A growth-oriented portfolio is a collection of investments selected for their price appreciation potential, while an income-oriented portfolio consists of investments selected for their current income of dividends or interest.

The selection of investments will depend on one's tax bracket, need for current income and the ability to bear risk, but regardless of the risk-return objectives of the investor, it is natural to want to minimize risk for a given level of return. The efficient portfolio consists of investments that provide the greatest return for the risk, or—alternatively stated—the least risk for a given return. To assemble an efficient portfolio, one needs to know how to calculate the returns and risks of a portfolio, and how to minimize risks through diversification.

Some investments are riskier than others – there's a greater chance you could lose some or all of your money. For example, Canada Savings Bonds (CSBs) have very low risk because they are issued by the government of Canada. GICs and bank deposits also carry low risk because they are backed by large financial institutions. With GICs and deposits, you also have the additional protection of deposit insurance on amounts up to $100,000 if your financial institution goes bankrupt. With these low-risk investments, you are unlikely to lose money. However, they have a lower potential return than riskier investments and they may not keep pace with inflation.

Over the long-term, bonds have a potentially higher return than CSBs and GICs, but they also have more risks. Their prices may drop if the issuer's creditworthiness declines or interest rates go up. If prices drop, you will incur a loss.

Stocks have a potentially higher return than bonds over the long term, but they are also riskier. Bond investors are creditors. As a bond investor, you're legally entitled to fixed amounts of interest and principal and are repaid in priority if the company goes bankrupt. However, if the company is successful, you won't earn more than the fixed amounts of interest and principal. Shareholders are owners. As a shareholder, if the company is unsuccessful, you could lose all of your money. But if the company is successful, you could see higher dividends and a rising share price.

Some investments, such as those sold on the exempt market are highly speculative and very risky. They should only be purchased by investors who can afford to lose all of the money they have invested.

There is a clear (if not linear) relationship between risk and returns.

Try finding an asset, where there is no risk. Chances are that you will end up with an asset giving very low returns. Again try finding an asset that offers very high returns. We are sure you would have chosen a very risky asset.
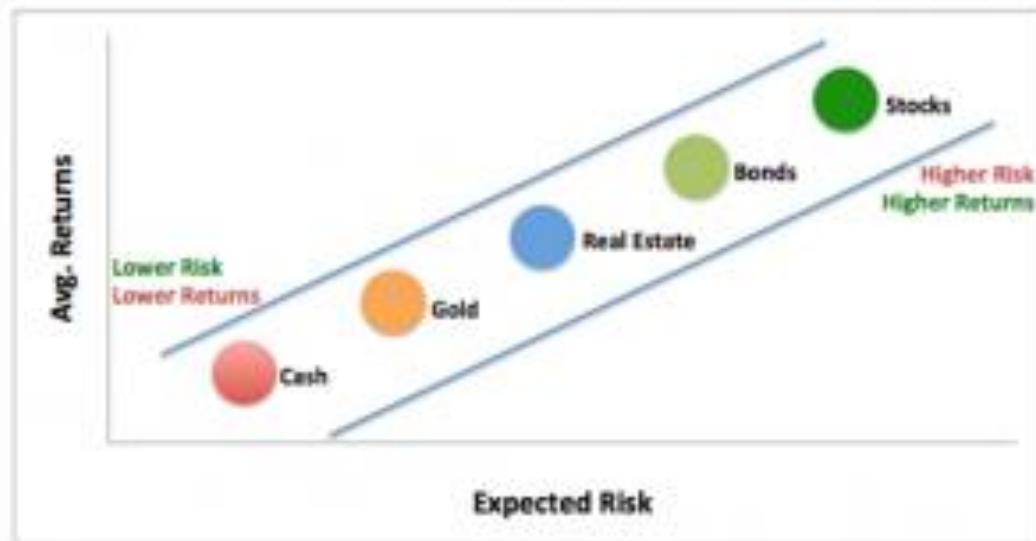
Now risk cannot be eliminated completely. At best, investors can manage the risk in their investments.

So when investing in shares, you can either have a concentrated portfolio of few stocks or a diversified portfolio of many stocks. The risk of holding a concentrated portfolio is that if value of even one company goes down, it will have a big impact on the overall portfolio returns.

Instead to reduce the risk, one can choose to invest in a diversified portfolio of stocks. This way, a fall in share price of even few stocks will not have a large negative impact on the overall portfolio returns. This is the exact principle on which fund managers build mutual fund portfolios.

Another way to reduce risk is to diversify across assets and hold a portfolio of stocks, bonds, bank deposits, gold and other assets. What happens then is that bank deposits, bonds, gold, etc. will provide stability to the portfolio, albeit at the cost of lower returns. Stocks on other hand will provide higher long-term returns and improve overall portfolio returns.

Time also plays a big role in deciding the returns obtained by investors. It has been empirically found that when investing in good stocks, the longer your investment horizon is, lower are the associated risks and returns are comparatively better than other asset classes. Having a long investment period averages out the short-term volatility of returns.

Humans have a tendency to reduce the risk that they take. You too can choose to invest only in safe assets like bank deposits or hold cash. But then, your investments will lose value over time (due to inflation). And you don't want that.

It's better to assess your risk tolerance and choose investments intelligently. Taking on some risk is necessary to achieve adequate returns. So try and find the ideal balance for your investments, which gives you the best risk-adjusted returns for your investments.

Justification for Portfolio Theory

The theory was developed by Markowitz in 1952. The thinking behind the explanation given by the theory of reducing the effect of spreading investment risk over a range asset is that in a portfolio, unexpected project failure will be compensated for, to some extent, by the unexpected good news in another investment or project.

In the theory, Harry Markowitz has an instrument to measure or identify investment portfolio which gives the highest return for a particular level of risk. The return earned on a share which is referred to as the holding period returns for one year is:

R = Dividends Received + (share price at the end of period —   purchase price)
                                          Purchase Price

$$R = \frac{D_1 + P_1 - P_0}{P_0}$$

Assumptions of Portfolio theory

1. That all investors are rational and risk-averse. This assumption that investors do not like risk is one of the foundations of portfolio theory, without this, the issue of diversification becomes less important.
2. That investors hold well diversified portfolio instead of investing their entrepreneur's wealth in a single or few assets.
3. Investors seek to maximize utility which is a function of risk and expected return.
4. That portfolio with the higher expected return and lower risk would be preferred to the one with the lower expected return.
5. If 2 securities or investments have the same risk but different expected returns, the one with higher expected return will be selected.
6. If two securities or investments have the same expected risk the one with lower expected risk will be selected.
7. Risk is measured by the standard deviation of returns.
8. It is assumed that there is no transaction cost.
9. The market for shares is perfect.
10. There is no taxation.
11. For a given risk level, investors prefer higher return than lower return.

Portfolio Return

According to Pandey, "Portfolio Return equals the weighted average of the returns of individual assets (securities) in the portfolio, with weights being equal to the proportion of investment value in each asset". It is always a linear function.

Portfolio Return of a given portfolio can be expressed using the formula:

$$E (RP) = \sum_{t=1}^{n} W_i R_i \quad \text{...} \quad (2)$$

For an 'n' asset portfolio.

Where W_i = proportion of investment value in each asset.

R_i = Return on each asset.

In a situation where the expected return 'R_i' is a probability-weighted average of its return in all scenarios, $\sum(R_i) = \sum P_i R_i$

In that case, $ER_P = \sum W_t(E (R_p) = \sum W_t(\sum R_i P_i)$ .... (3)

      n   = Number of security in the portfolio

For a portfolio that consists of 2 securities x and y the expected return of the portfolio, can be expressed as:

      $E(RP) = wx\sum(Rx) + wy\sum(Ry)$
      Where;
      W_1 = Proportion of investment value of X
      W_2 = Proportion of investment value of Y
      Such that $W_1 + W_2 = 1$
      $E(RP) = wx\sum(Rx) + wy\sum(Ry)$
      And $\sum R_x$ = Expected return on x, $\sum R_Y$ = Expected return on Y
      $E(Rp)$ = Expected return of a portfolio
  wx = weighted or proportion of total funds invested in security x.
    wy= weighted or proportion of total fund invested in security y

$$E(Rp) = \frac{inv.x}{inv.P} (E(Rx)) + \frac{inv.y}{inv.P} (E(Ry)) + \frac{inv.z}{inv.P} (E(Rz)) \quad \text{....................}(4)$$

for 3 assets X, Y, Z
     where;   Inv.x is the proportion of x in P as in Y and as in Z.
           Inv.P

Illustration 1

Suppose Mr. Ronaldo has the opportunity to invest 40% of his wealth in Asset A and the remaining in Asset B. Calculate the portfolio return if the returns of the two Assets in different states of the economy are:

     State   Return

Economy	Prob.	A	B
A	0.15	5	-3
B	0.25	4	4
C	0.20	0	2
D	0.15	-2	1
E	0.25	1	-1

Solution.

$$E(RP) = wxE(Rx) + wyE(Ry)$$

$$= wxE(Rx) + (1 - wx)(E(Ry))$$

While $E(Rx) = \sum_{t=1}^{n}(R_i P_i)$,

Therefore

= 0.15(5) + 0.25(3) +0.20(0) + 0.15(-2) + 0.25(1)
= 0.75 + 0.75 + 0 + (-0.3) + 0.25
= 1.45%

While $E(Ry) = \sum_{i=1}^{n}(R_i P_i)$

= 0.15(-3) + 0.25(4) + 0.20(2) + 0.15(1) + 0.25(-1)
= 0.45 + 1.0 + 0.4 + 0.15 + (-0.25)
= 0.85%
Expected Return on Portfolio.
E(Rp) = wxE(Rx) + wy(Ry)
Wx = 40% = 0.4
Wy = 60% = (1-0.4) = 0.6
Therefore, the expected return of the portfolio
E(Rp) = 0.4(1.45) + 0.6(0.85)
= 0.58 + 0.51 = 1.09%

Illustration 2

The following information is the possible outcome from asset x, y, z in the portfolio of N1, 000,000 having N200, 000, N500, 000 and N300, 000 respectively.

State of Economy	Prob	Returns X	Y	Z
A	0.10	4	3	-3
B	0.20	5	2	4

C	0.30	7	5	-2
D	0.15	8	0	1
E	0.25	-2	-1	0

Calculate the following:

a.   Expected return on Asset X
b.   Expected return on Asset Y
c.   Expected return on Asset Z
d.   Expected return on the portfolio.

Solution

Total portfolio   =   N1, 000,000 = 100%

Weight of each security.

X	Y	Z

$\dfrac{200,000}{1,000,000}$ $\dfrac{500,000}{1,000,000}$ $\dfrac{300,000}{1,000,000}$

= 0.2   0.5   0.3

a. Expected return on security X

$$E\,(Rx) = \sum_{i=1}^{n}(R_iP_i)$$

4(.10) + 5(.20) + 7(.30) + 8(.15) x -2(.25)

0.4 + 1 + 2.1 + 1.2 + -0.5

=   4.2%

b. Expected return on security Y

$$E\,(Ry) = \sum_{i=1}^{n}(R_iP_i)$$

3(.10) + 2(.20) + 5(.30) + 0(.15) x -1(.25)

0.3 + 0.4 + 1.5 + 0 + -0.25

=   1.95%

c. Expected return on security Z

$$E(Rz) = \sum_{i=1}^{n} (R_i P_i)$$

-3(.10) + 4(.20) + -2(.30) + 1(.15) + 0(25)

= -0.3+0.8 -0.6 + 0.15 + 0 = 0.05

d. Expected return on the portfolio

$$E(Rp) = \frac{inv.x}{inv.P} (E(Rx) + \frac{inv.y}{inv.P} (E(Ry) + \frac{inv.z}{inv.P} (E(Rz)$$

Therefore:

$$E(Rp) = \frac{200,000}{1,000,000} (4.2\%) + \frac{500,000}{1,000,000} (1.95) + \frac{300,000}{1,000,000} (0.05)$$

0.2 (4.2) + .5 (1.95) + .3 (0.05)

0.84% + 0.975 + 0.015

= 1.83%

Illustration 3

The securities of Company Y and Company Z have the following expected returns and standard deviation.

	Y	Z
Expected Return %	20	25
Standard Deviation %	30	40

Calculate the expected return for the following portfolio

i	100%	Y		0%Z
ii	70%	Y	+	30%Z
iii	50%	Y	+	50%Z
iv	30%	Y	+	70%Z
v	100%	Z		0%Z

Solution

Rp   =   Wy Ry,   therefore,

a. l00%Y + 0%Z =   1(,2) + 0 =. 2
b. 70%Y + 30%Z = .7 (.2) + .3 (.25)
                        = .14 + 0.075=0.225

c. 50% Y + 50% Z = .5 (.20) + .5 (.25)

                          = .1 + 0.125

                          = .225

d. 30% Y + 70% Z = .3 (.2) + .7 (.25)

                          = .06 + 0.175

                          = 0.235

e. 0% + 100% Z = 0 (.2) + 1 (.25)

                          = 0+.25

                          = .25

Illustration 4

Mr. Kokos plans to invest N10,000 in company x at the beginning of the year At the end of the year the possible Values may be N10,400 or N10,600 or N10,800 or N11,000. There are all possible outcomes and their probabilities, respectively are 0.2, 0.3, 0.3, 0.2. Calculate the expected return, E(R).

Solution:

Value at year end N		Prob. of Return	Returns (Workings)
10,400	0.04	0.2	$\dfrac{10,400 - 10,000}{10,000}$ = 4%
10,600	0.06	0.3	$\dfrac{10,600 - 10,000}{10,000}$ = 6%
10,800	0.08	0.3	$\dfrac{10,800 - 10,000}{10,000}$ = 8%
11,000	0.10	0.2	$\dfrac{11,000 - 10,000}{10,000}$ = 10%

$E(R_x) = R_1P_1 + R_2P_2 + R_3P_3 + R_4P_4$

where;

R_i = Return of x

P_i = Prob. Of Return on x.

$E(R_x) = (4 \times .2) + (6 \times .3) + (8 \times .03) + (1 \times 2)$

      =   0.8 + 1.8 + 2.4 + 2 = 7%

Security Risk:

This is a measure of the variability of security returns. The traditional measure of security risk is the standard deviation of security returns which is the square root of the mean of squared deviations of security returns from the expected security return i.e.

$$\sigma_i = \sqrt{\sum_{i=}^{n} \frac{[(R_i - E(R_i)]^2}{n}} \dots\dots\dots\dots\dots\dots\dots\dots\dots(5) \text{ for n variable returns of security (i).}$$

$$= \sqrt{\sum P_i \, [(R_i - E(R_i)]^2} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{ (6)}$$

where R_i is security return for each state 'I' of the security with prob. P_i.

Example:

Let 5%, 4%, 8%, 3% be possible returns for security x for A, B, C, D prob. states of the economy with probabilities 0.25, 0.3, 0.3, 0.15 respectively. The risk in security x can be calculated as follows:

States of the Economy	Prob.	Return on % x	R_iP_i	Deviation: R_i-$E(R_i)$	Variance: $[P_iR_i$-$E(R_i)]^2$	$P_i(P_iR_i$-$ER_i)^2$
A	0.25	5	1.25	-0.6	0.36	0.09
B	0.30	4	1.20	-1.6	2.56	0.768
C	0.30	8	2.40	2.4	5.76	1.728
D	0.15	3	0.75	-2.6	6.76	1.014
			$E(R_iP_i)= 5.6$			**3.60**

Standard Deviation σ = $\sqrt{3.60}$
= 1.897%

Portfolio Risk

Portfolio risk can be measured by determining the standard deviation of portfolio return.

For a two security portfolio, the risk is measured as:

$$\sigma_P = \sqrt{W_A{}^2\sigma_A{}^2 + W_B{}^2\sigma_B{}^2 + 2W_AW_B \, Con(A,B)} \dots\dots\dots\dots\dots\dots\dots\dots \text{ (7)}$$

Where

W_A = Proportion of A in the portfolio

W_B = Proportion of B in the portfolio

$\sigma_A{}^2$ = Variance of returns of A

$\sigma_B{}^2$ = Variance of returns of B

The covariance between securities A and B depends on the correlation coefficient between A and B and the standard deviations σ_A, σ_B and can be calculated as:

Cov (A,B) = $\rho_{AB} \times \sigma_A \times \sigma_B$

ρ_{AB} = Correlation coefficient between A and B which lies in the range (-1, + 1)

Hence, we can redefine σ_P for a two asset portfolio as:

$$\sigma_P = \sqrt{W_A{}^2\sigma_A{}^2 + W_B{}^2\sigma_B{}^2 + 2W_A W_B 2\, \rho_{AB}\sigma_A\sigma_B} \quad ....(8)$$

for Assets A and B.

Illustration 5

The securities of company x and y have the following expected returns and standard deviation:

	X	Y
Expected Returns %	20	15
Standard Deviation %	35	24

Assume that the correlation coefficient between the returns of the two securities is 0.4.

a. Calculate the expected returns and the standard deviation for the following portfolio.

    I.   100%x

    ii.   75% x and 25%y

    iii.   50%x and 50%y

    iv.   25%x and 75%y

    v.   0%x and 100%y

b. Which of the portfolios in (a) above is optimal? When is a portfolio at the optimal level?

Solution – Return of Portfolio.

A (i)   RP = WxRx + WyRy

    i.   100%x + 0%y = 1(.20) + 0(.15) .20 + 0.20

    ii.   75%x + 25%y = .75(.20)+.25(.15)=0.15+0.375=0.187

    iii.   50%x + 50%y = .50(.20) + .50(.15) 0.1 + 0.075 = 0.175

    iv.   25%x + 75%y = .25(.20) + .75(.15) = 0.05 + 0.1125=1625

    v.   0%x + 100%y = 0(.20) + 1(.15) = 0 + .15 = 0.15

A (ii)   Standard Deviation of Portfolio

$$\sigma_P = \sqrt{W_X{}^2 \sigma_X{}^2 + W_Y{}^2 \sigma_Y{}^2 + 2 W_X W_Y \sigma_X \sigma_Y \rho_{XY}}$$

where P_{XY} is the correlation coefficient of (X, Y).

i.   100%x + 0%y = $\sqrt{(1)^2(.35)^2 + (0)^2(.24)^2 + (2)(1)(0)(.35)(.24)(.4)}$

$= \sqrt{0.1225 + 0}$

$= 0.35$

ii.   75%x + 25%y = $\sqrt{(.75)^2(.35)^2 + (.25)^2(.24)^2 + 2(.25)(0.25)(.35)(.24)(.40)}$

$= \sqrt{0.03515625 + 0.036 + 0.0126}$

$= \sqrt{0.05135625}$

$= 0.2266.$

iii.   50%x + 50%y = $\sqrt{0.030625 + 0.0144 + 0.0168}$

$= \sqrt{0.061825}$

$= 0.24864$

$= 0.25$

iv.   25%x + 75%y = $\sqrt{(.25)^2(.35)^2 + (.75)^2(.24)^2 + 2(.25)(.75)(.35)(.24)(.40)}$

$= \sqrt{0.00765625 + 0.0324 + 0.0126}$

$= \sqrt{0.052665625}$

$= 0.2295$

v.   0%x + 100%y = $\sqrt{(0)^2(.35)^2 + (1)^2(.24)^2 + 2(0)(1)(.35)(.24)(.40)}$

$= \sqrt{0 + 0.0576 + 0}$

$$= 0.24$$

Standard Deviation for an n-Asset Portfolio

If W_i = proportion of investment allocated to Asset 'i', wj is the proportion of the investment allocated to Asset j, for all

i = 1, 2, 3 …….. n

j = 1, 2, 3 …….. n

P_{ij} = The Correlation coefficient between security i, and security j, i, j = 1, 2, ……n, there will be n variance terms i.e. $W_i^2\sigma_i^2$ and n(n-1) covariance terms i.e. $W_iW_j \rho_{ij}\sigma_i\sigma_j$, then, equation (8) above can be expanded for an n-Asset portfolio as:

$$\sigma_P = \sqrt{\sum_{i=1}^{n} w_i^2\sigma_i^2 + 2\sum_{i=1}^{n}\sum_{j=1}^{n} W_jW_j\rho_{ij}\sigma_i\sigma_j} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (9)$$

This general operation for portfolio risk becomes very complex as n increases.

Optimal Portfolio

It occurs at a given point where the return on a portfolio is maximum and the risk is minimum.

The optimal portfolio is determined from the table below.

Portfolio	Portfolio Return	Portfolio Risk.
i. 100%x + 0%y	0.2	0.35
ii. 75%x + 25%y	0.1875	0.29
iii. 50%x + 50%y	0.175	0.25
vi. 25%x + 75%y	0.1625	0.23
v. 0%x + 100%y	0.15	0.25

The optimal portfolio is 25%x + 75%y because it has the least risk.

Co-variance of Portfolio

This refers to the measure of the relationship between securities in the portfolio which can be either positive or negative or zero relationship. Covariance measures the extent to which the returns on two investments co-vary or co-move. If the returns tend to go up together and go down together then the covariance will be a positive number.

If however, the return on one investment moves in the opposite direction to the returns on another when a particular event occurs, then these securities will exhibit negative covariance. If then there is no movement at all, that is the return are independent of each other the covariance will be zero. Portfolio risk or standard deviation depends on the degree of covariance of the returns of securities in the portfolio.

Positive covariance or positively correlated investment implies that the returns of the securities in a portfolio move in the same direction i.e. the increase in the return of one security leads to the increase in the return of the other. The correlation coefficient is always positive but if the correlation coefficient is +1 between two securities in a portfolio, then the two securities are perfectly positively correlated.
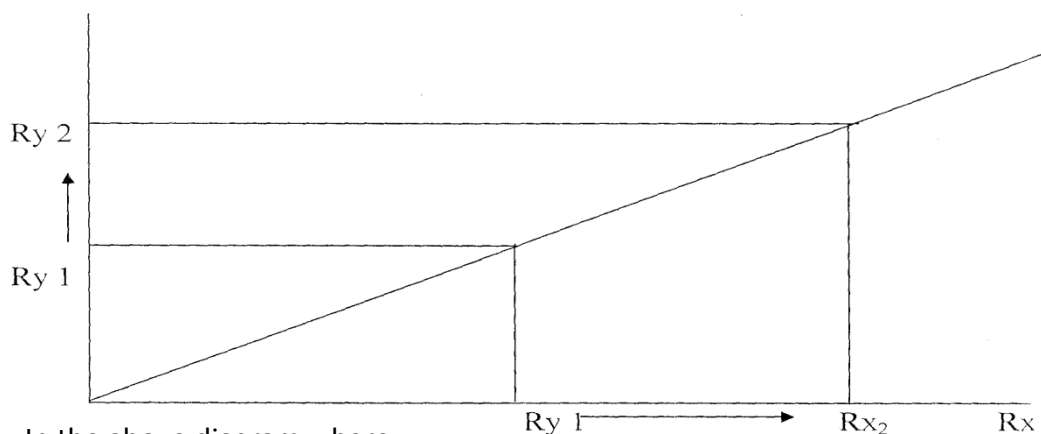
In the above diagram where

   Ry -   represents Return in asset Y

   Rx -   represents Return in asset X

An increase of the return Rx1 to Rx2 leads to increase of Ry1 to Ry2,

Negative covariance:- a negatively correlated investment portfolio implies that the returns of securities in the portfolio move in opposite directions. The increase in the returns of one security leads to the decrease in the return of the other. The correlation coefficient is always -1, two securities in a portfolio are perfectly negatively correlated.
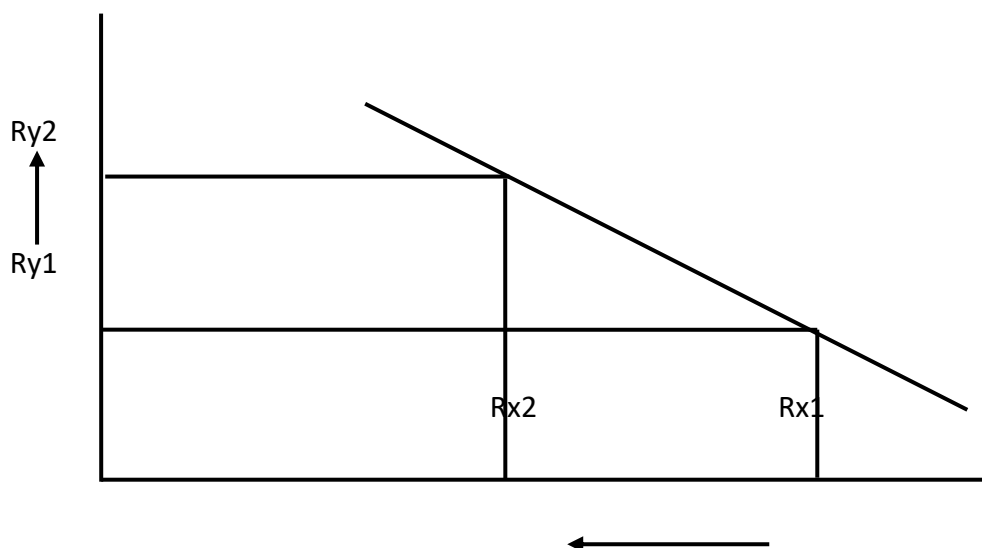
Zero covariance- Where an increase or decrease in one does not affect the other.

Measurement of Covariance

Assuming 2 Assets X, Y in the portfolio

$$\text{Cov x, y} = \sum_{i=1}^{n} [Rx - E(Rx)][Ry - E(Ry)]P_i$$

where Pi = the probability of return for i = 1, 2, 3... n returns for each asset x, y.

Assuming Assets are more than 2 say, x, y, z:

$$\text{Cov x, y, z} = \sum_{i=1}^{n} [Rx - E(Rx)][Ry - E(Ry)][Rz - E(Rz)]P_i$$

where Pi = Probability of return for each return i =1, 2, 3... n for assets x, y, z.

Steps in the computation of covariance of securities x and y.
a.   Define the expected Returns of the individual asset. (E(Rx), E (Ry), E (Rz)

b.   Determine the deviation of Returns from expected returns of individual assets and multiply the deviations:

(Rx — E(Rx) (Ry — E(Ry) (Rz — E(Rz)

C.   Determine the summation of the product of deviation and probability of returns of individual assets.

Σ (Rx — E(Rx) (Ry — E(Ry) (Rz — E(Rz) P1

i = l

Correlation Coefficient

Correlation is about the relationship between two or among more than two variables. The value of correlation is called correlation coefficient

And is calculated as follows.

$$\rho_{x,y} = \frac{\text{Covariance x, y}}{\delta_x \times \delta_y}$$

Where;

$$\text{Covariance} = \sum_{i=1}^{n} (Rx - \overline{Rx})(Ry - \overline{Ry})P_i$$

For assets X, Y and $\rho_{x,y}$ = the correlation coefficient of x, y.

OR

Cov x, y = δx δy (Corr. x, y)

Correlation Coefficient usually has a value between +1 and –l

+1 implies Positive perfect correlation which means movement in the same direction while -1 implies Negative perfect correlation which means movement in the opposite directions.

A coefficient of correlation of 0 implies that there is No correlation.

Importance of Covariance (and the Correlation Coefficient)

a. It measures statistically the extent to which two security returns move together. If 2 securities, having the same probability of performing well together or badly together, their returns are said to be in the same direction. They would have positive co-variance. But if their returns move in opposite directions, their covariance will be negative. And if the movement of the returns of one is independent of the movement of the other's return, the signs will cancel out and covariance will be zero.
b. Correlation coefficient (corr xy) is the covariance of x and y divided by the product of the standard deviation of the two securities. It is another way of quantifying the covariance between returns on securities x and y. It takes value between -l and +1
If correlation coefficient 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.

Illustration 6

Suppose you have opportunity to invest 40% of your wealth in Asset x and the remaining on Asset y:

1.   Calculate the portfolio risk, and the variance of the portfolio.

2.   The correlation coefficient of the securities in the portfolio should also be ascertained.

State of the economy	Prob.	X Returns	Y
A	0.15	5	-3
B	0.25	3	4
C	0.20	0	2
D	0.15	-2	1
E	0.25	1	-1

E (Rx) = 1.45   E(Ry) = 0.85   (given)

Solution

(i)a   Calculation of portfolio Risk

$$\sigma_P = \sqrt{W_X{}^2\sigma_X{}^2 + W_Y{}^2\sigma_Y{}^2 + 2W_XW_Y\sigma_X\sigma_Y \text{ Cov}(x,y)}$$

Where

$W_x = 0.4$

$W_y = 0.6$

$$= \sqrt{(4.739)(.16) + (5.812)(.38) - (0.2569)}$$

$$= \sqrt{0.7582 + 2.092 - (0.2569)}$$

$$= \sqrt{2.850 - 0.2569}$$

$$= \sqrt{2.5931}$$

$$= 1.610\% = .01610$$

Step 1: Standard deviations of x and y

$$\sigma_x = \sqrt{\sum_{i=1}^{n} [(Rx - E(Rx)^2]P_i}$$

σ_x
$$= \sqrt{(5 - 1.45)^2(.15) + (3 - 1.45)^2(.25) + (0 - 1.45)^2(.20) + (-2 - 1.45)^2(.15) + (1 - 1.45)^2(.25)}$$

$$= \sqrt{1.89 + 0.60 + 0.42 + 1.78 + 0.05}$$

$$= 2.177\%$$

$$= 0.02177$$

$$\sigma_y = \sqrt{\sum_{i=1}^{n} [(Ry - E(Ry)^2]P_i}$$

σ_y
$$= \sqrt{(-3 - 0.85)^2(.15) + (4 - 0.85)^2(.25) + (2 - 0.85)^2(.20) + (1 - 0.85)^2(.15) + (-1 - 0.85)^2(.)}$$

$$= \sqrt{2.22 + 2.48 + 0.26 + 0.003 + 0.85}$$

$$= \sqrt{5.813}$$

$$= 2.411\%$$

$$= 0.02411$$

Step 2: Obtain the covariance of x and y

$$\text{Cov x, y} = \sum_{i=1}^{n} [Rx - E(Rx)][Ry - E(Ry)]P_i$$

Therefore:

[(5 – 1.45)] [-3 – 0.85) (.15)

[(3 – 1.45)] [(4 – 0.85)](.25)+

[(0 – 1.45)] [2 – 0.85)] (0.20) +

[-2 – 1.45)] [(1 – 0.85)] (0.15) +

[1 – 1.45)] [(1 – 0.85)] (0.25) +

Equals

(3.55) (-3.85) (0.15) = -2.050

(1.55) (3.15) (0.25) = 1.22

(-1.45) (1.15) (0.20) = -0.333

(-3.45) (0.15) (0.15) = -0.0776

(-0.45) (-1.85) (0.25) = +0.21

Cov (x, y) = -1.03

Step 3: Obtain the variance of portfolio

$$\sigma_P{}^2 = W_X{}^2\sigma_X{}^2 + W_Y{}^2\sigma_Y{}^2 + 2W_XW_Y\sigma_X\sigma_Y \text{ Cov}(x,y)$$

$$\sigma_P{}^2 = 2.177^2(0.4)^2 + (2.411)^2(0.6)^2 + 2(0.4)(0.6)(2.177)(2.411)(-1.03)$$

$$= (4.739 \times 0.16) + (5.812)(0.36) - 0.2595$$

$$= 0.7582 + 2.0923 - 0.2595$$

$$= 2.8505 - 0.2595$$

$$= 2.591$$

Step 4: Obtain the correlation coefficient

$$\text{Corr}(X, Y) = \frac{\text{Cov }(x, y)}{\delta_x\delta_y}$$

$$= \frac{-1.03}{0.02177 \times 0.02411}$$

$$= \frac{-1.03}{2.177 \times 2.411}$$

$$= -0.1962$$

Comment:

= Weak negative correlation coefficient of 0.1962.

Illustration 7

Bounsa has just won N100,000 from Lagos Lotto Draw and has decided in the interim to place the money on 2 securities x and y for a period of one year. N60,000 to be placed on security x and the balance return (that is cash flow to be received at the end of that year plus project value at that time) and the probabilities of the three possible state are as follows;

State	Prob	Security x	Security y
A	0.3	75,000	45,600
B	0.45	73.200	47,200
C	0.25	67,200	48,000

a.   Calculate the expected returns, variance, and standard deviation of each security
b.   Calculate the covariance between the two securities and correlation coefficient.
c.   What are the returns of the portfolio for each of the possible status A,B,C
         Calculate the expected returns variance and standard deviation of the portfolio from these figures

d.   Using the general formula for the mean return and variance and standard deviation of his portfolio
e.   Would your answer to (d) above be different, if the correlation had been +1, + 0.5, or -1, what conclusion would you draw?

Solution

Workings: -

Obtain the rate of returns for x and y

State of economy for x

A   75,000 - 60,000   =   25%   =   .25
            60,000

B   73,200 - 60,000   =   22%   =   .22
            60,000

C   67,200 - 60,000   =   12%   =   .12
            60,000

State of Economy for y

A.   = $\dfrac{45,600 - 40,000}{40,000}$ =   14% = .14

B   = $\dfrac{47,200 - 40,000}{40,000}$ =   18%   =   .18

C   = $\dfrac{48,000 - 40,000}{40,000}$ =   20)%   =   .2

A (i)   i. Expected Returns: ii. Variance and iii. Standard Deviation

Computation
Security x ΣER (i)   Variance (ii)

State	RX	Prob	RiPi	$\Sigma(RX-RX)^2 p$
A	0.25	0.30	0.075	0.0006348
B	0.22	0.45	0.099	0.0001152
C	0.12	0.25	0.03	0.001764
			0.204	0.0025 14

Variance   =   0.002514

iii.   Standard Dev. =   0.002514

     Ry   = $\sqrt{0.5013}$

   c. Computation of co-variance between the 2 securities, Covariance

     = $\Sigma p(\overline{RX} - RX)(RY - \overline{RY})$

State	Prob	RX	RY	RX - $\overline{RX}$	RY - $\overline{RY}$
A	0.3	0.25	0.14	0.046	-0.033
B	0.45	0.22	0.18	016	0.007
C	0.25	0.12	0.20	0.084	0.027

$\Sigma P(Rx - \overline{Rx})(Ry - \overline{Ry})$

A   =   0.3 x 0.046 x -0.033   =   -0.0004554

B   =   0.45 x 0.0 16 x 0.007   =   0.0000504

C   =   0.25 x 0.084 x 0.027   =   0.0000567

         Cov of x, y   =   0.000162

Comment

The co variance is positive than the risk is at its peak because such securities moves towards the same direction, it is recommended for portfolio diversification.

C.   Compute the portfolio Returns.

Rp   =   WxRx + WyRy

State	WxRx		WyRy	Rp	Prob		Rp	Prob
A	.6(25)	+	.4(0.14)	0.206	0.3		0.0618	
B	.6(.22)	+	.4(.18)	0.204	0.45		0.918	
C.	6(.12)	+	.4(20)	0.152	0.25		0.038	

0.1916

Variance of portfolio calculated from each state (Rp – Rp)Pi

A   0.000062208
B   0.000069192
C   0.00039204
        0.00052344
σp   =   √0.00052344
       =   .0228788

d.

$$\sigma_P = \sqrt{W_X{}^2\sigma_X{}^2 + W_Y{}^2\sigma_Y{}^2 + 2W_XW_Y\sigma_X\sigma_Y\,P_{XY}}$$

$$= \sqrt{(.60)^2(0.05014)^2 + (.40)^2(0.02304)^2 + 2(.6)(.4)(0.05014)(0.02304)(-0.8414)}$$

=   (0.36)(0.002514096) + (.16)(.0005368416)- (0004665632735)

       =   .000905 04705 + 00008493465 — 0.0004665632735

       =   0.00052341843

       =   0.0228

       =   0.023

Test when correlation co-efficient   =   -1 or 0

Limitations of Portfolio Theory

a.   It relies on past data to predict future risk and return
b.   It involves complicated calculations
c.   Indifferent curve generation is difficult
d.   Few investment manager use computer programs.

4.04 Efficient Portfolios, Efficient Frontier, Capital Market Line, Security Market Line and Others.

An **efficient portfolio**, also known as an 'optimal portfolio', is one that provides that best expected return on a given level of risk, or alternatively, the minimum risk for a given expected return. A portfolio is a spread of investment products.

If, given a particular level of risk, the expected returns are not met, or if the risk required to achieve that expected level of return is too high, it is called an 'inefficient portfolio'.

American economist Harry Max Markowitz (born 1927), a recipient of the 1990 Nobel Memorial Prize in Economic Sciences, who introduced the Modern Portfolio Theory in 1952, said that the holder of an efficient portfolio cannot diversify any further to increase the expected rate of return without accepting a higher level of risk.

The efficient frontier is the set of optimal portfolios that offers the highest expected return for a defined level of risk or the lowest risk for a given level of expected return. Portfolios that lie below the efficient frontier are sub-optimal, because they do not provide enough return for the level of risk. Portfolios that cluster to the right of the efficient frontier are also sub-optimal, because they have a higher level of risk for the defined rate of return.

BREAKING DOWN 'Efficient Frontier'

Since the efficient frontier is curved, rather than linear, a key finding of the concept was the benefit of diversification. Optimal portfolios that comprise the efficient frontier tend to have a higher degree of diversification than the sub-optimal ones, which are typically less diversified. The efficient frontier concept was introduced by Nobel Laureate Harry Markowitz in 1952 and is a cornerstone of modern portfolio theory.

Capital market line (CML) shows graphically the relationship between risk measured by standard deviation and return of portfolios consisting of risk-free asset and market portfolio in all possible proportions.

Definition

Capital market line (CML) is a graph that reflects the expected return of a portfolio consisting of all possible proportions between the market portfolio and a risk-free asset. The market portfolio is completely diversified, carries only systematic risk, and its expected return is equal to the expected market return as a whole. In general terms, the expected return of a particular portfolio (E (R_C)) can be calculated as follows

E(R_C) = y×E(R_M) + (1-y) ×R_F

Where y is a proportion of a market portfolio, E (R_M) is an expected return of a market portfolio, (1-y) is a proportion of a risk-free asset, and R_F is a risk-free rate.

The return of no leveraged portfolios can be less than or equal market return (if the proportion of the market portfolio equals 1 or 100%), but the return of a leveraged portfolio can significantly exceed market return.

i.   CML Equation

The capital market line equation can be written as follows.

$$E(R_c) = R_F + SD_c \frac{E(R_M) - R_F}{SD_M}$$

Where, SD_C is a standard deviation of portfolio C return, SD_M is a standard deviation of a market return.

The slope of CML is defined by reward to variability ratio (RVR).

$$RVR = \frac{E(R_M) - R_F}{SD_M}$$

Examples

Let's assume that current risk-free rate is 5%, expected market return is 20% and standard deviation of a market portfolio is 10%. Thus CML equation is as follows.

$$E(R_c) = 5 + SD_c \frac{20 - 5}{10} = 5 + 1.5 \times SD_c$$

Suppose there are two portfolios:

i Lending (non-leveraged) Portfolio A with standard deviation 5%

ii Borrowing (leveraged) Portfolio B with standard deviation 15%

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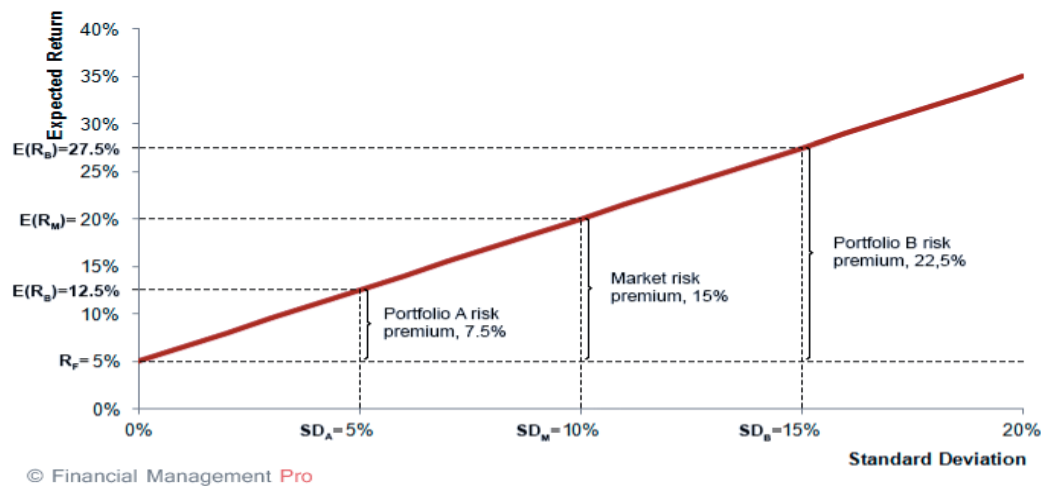
The expected return of Portfolio A is 12.5% and the expected return of Portfolio B is 27.5%.

$E(R_A) = 5+1.5*5 = 12.5\%$

$E(R_B) = 5+1.5*15 = 27.5\%$

ii.   Limitations of use

The key problem of capital market line in real markets conditions is that CML is based on the same assumptions of Capital Asset Pricing Model (CAPM).

1. There are taxes and transaction costs, which can significantly differ for various investors.
2. It is supposed that any investor can either lend or borrow an unlimited amount at the risk-free rate. In real market condition investors can lend at a lower rate than borrow, that brings to bend of CML like on the figure below.

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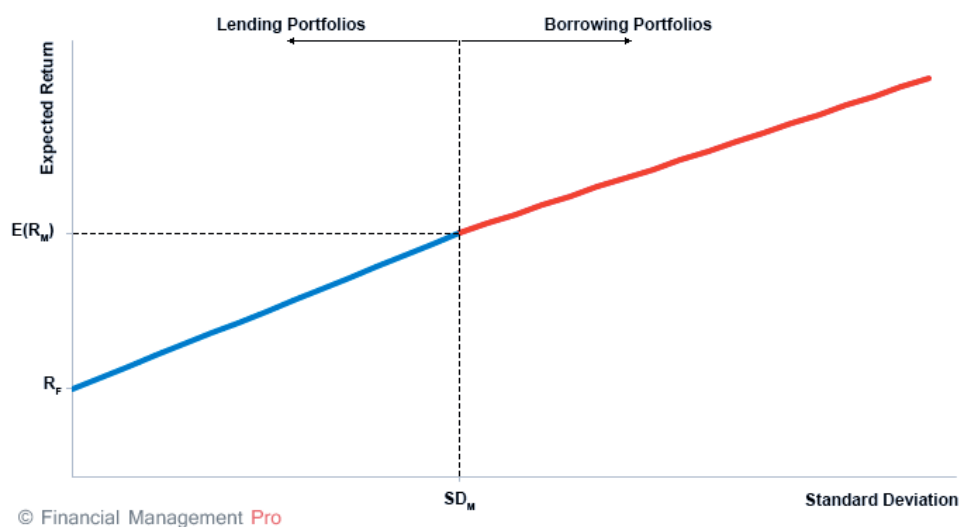
3. Real markets don't have a strong form of efficiency, so investors have unequal information.
4. Not all investors are rational and risk-averse.
5. Standard deviation isn't the only risk measurement, because real markets are subject to inflation risk, reinvestment risk, currency risk etc.
6. There are no risk-free assets.

Thus CML in real market condition looks like a fuzzy area rather than a precise line.

iii.   CML and efficient frontier

As was mentioned above capital market line represents all possible combinations of portfolios consisting of various proportions between risk-free asset and the market portfolio. On 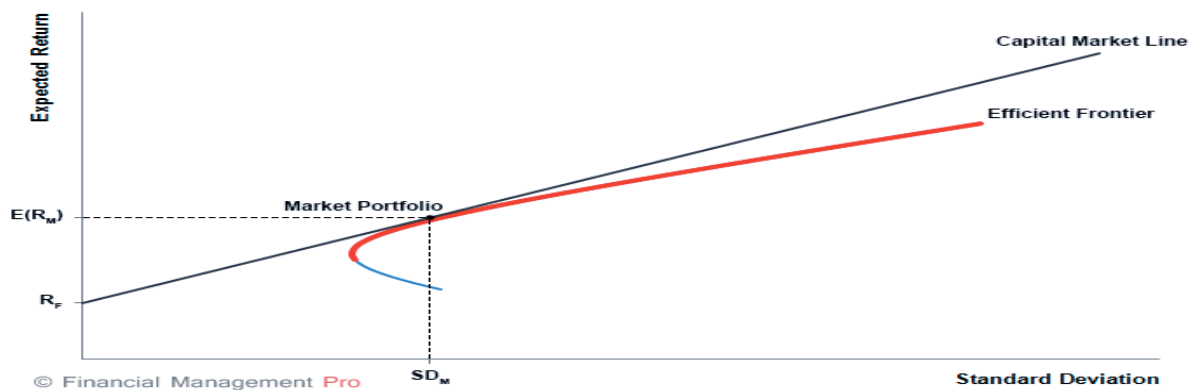the other hand, an efficient frontier represents all possible combinations of efficient portfolios, including only risky assets in various proportions.

The intercept point of CML and efficient frontier calls market or tangency portfolio. If investor is rational and risk-averse it will accept higher risk only when return increase proportionally. From this standpoint tangency portfolio is the most efficient portfolio.

The **Security Market Line**, or **SML**, is a line on a chart derived from the Markowitz Portfolio Theory. The Security Market Line is a graphical representation of the Capital Asset Pricing Model and it plots levels of risk against the expected return of the entire market at a given point in time.

Going by values of beta, the security market line shows that the relationship between risk and return is linear for individual securities (i.e. increased risk = increased return). Essentially it shows what return you need to earn on an investment in order for it to be worth taking, and this increases with the riskiness of the investment.

The formula for the Security Market Line is:

0   Required Return = Risk Free Rate + (Beta x [Market Return - Risk Free Rate])

Imagine you are screening a selection of stocks to determine where best to invest your hard earned bonus. You know that the risk-free rate in US Treasuries is currently 2%, and the S&P500 is returning approximately 5%. You have narrowed it down to Company A which has a beta of 0.6 and a return (including dividend) of 4% per annum and Company B which has a beta of 1.8 and a return of 7%.

The required return to invest in Company A is 2% + (0.6 x [5% - 2%]) = 3.8% and the required return for Company B is 2% + (1.8 x [5% - 2%]) which is 7.4%. In this scenario, you would be best placed to invest in Company A (all other things being equal) because the return you would earn on Company B is not enough to compensate you for the risk you are taking.

The Security Market line is an extremely effective tool when looking at portfolio composition and stock choices but should be treated with caution for several reasons:

1   Return over the risk-free rate is not the only thing to look at when making an investment choice
2   All of these numbers except for the risk-free rate are based on history

Despite these limitations, the SML is useful when determining your own risk curve.

4.05   Random Walk Hypothesis

The name of the random walk hypothesis refers to the broader concept of the random walk, which is a mathematical construct that describes a succession of random events. In finance, the hypothesis assumes that financial markets stock price changes are the random events.

The random walk hypothesis is closely related to the efficient market hypothesis, which also points to the futility of trying to make predictions about stock price movements. The efficient market hypothesis says that stock prices incorporate all available information that's relevant to the underlying company's financial prospects, and so any movement in the stock price that doesn't result from new information is essentially random. Moreover, if you believe that new information affecting a stock is as likely to be positive as it is negative, then the flow of that information is also a random event. That further supports the random walk hypothesis and its explanation of stock price movements.

Has the random walk hypothesis been proven?

The random walk hypothesis is antithetical to the views of any investor who believes that the stock market is predictable. Opponents of the hypothesis argue that the assumptions made by the theory are incorrect, and some believe they have definitively disproven the theory.

Some of those who argue against the random walk hypothesis point to certain events that produce non-random movement's in future stock prices. For instance, the 1999 book A Non-Random Walk down Wall Street, by Professors Andrew Lo and A. Craig MacKinlay, concludes that some predictable aspects do exist in share-price movements. One of the arguments the book makes is that technology will allow computers using high-frequency trading algorithms

to exploit extremely short-term anomalies in the stock markets, something that many market participants have increasingly experienced and criticized in their own investing.

More positively, long-term investors argue that even if short-term stock price movements are random, success in the long run depends on the performance of the underlying business. Some proponents extend the hypothesis to the conclusion that you can randomly pick stocks with an equal chance of success. But these opponents argue that the traits of successful companies are not random and that the efficient market hypothesis doesn't accurately take into account the information that allows investors to judge which companies are most likely to succeed.

The random walk hypothesis has merit in dissuading investors from trying to make guesses about short-term stock movements. However, many long-term investors still manage to invest well by putting time on their side.

4.06   Capital Assets Pricing Model (CAPM)

The capital asset pricing model (CAPM) is a model that describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for the pricing of risky securities, generating expected returns for assets given the risk of those assets and calculating costs of capital.

BREAKING DOWN 'Capital Asset Pricing Model - CAPM'

The formula for calculating the expected return of an asset given its risk is as follows:

$$\overline{r_a} = r_f + \beta_a (\overline{r_m} - r_f)$$

Where:
r_f = Risk free rate
β_a = Beta of the security
$\overline{r_m}$ = Expected market return

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free (rf) rate in the formula and compensates the investors for placing money in any investment over a period of time. The risk-free rate is customarily the yield on government bonds like U.S. Treasuries.

The other half of the CAPM formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium (Rm-rf): the return of the market in excess of the risk-free rate. Beta reflects how risky an asset is compared to overall market risk and is a function of the volatility of the asset and the market as well as the correlation between the two. For stocks,

the market is usually represented as the S&P 500 but can be represented by more robust indexes as well.

The CAPM model says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken. The security market line plots the results of the CAPM for all different risks (betas).

Example of CAPM

Using the CAPM model and the following assumptions, we can compute the expected return for a stock:

The risk-free rate is 2% and the beta (risk measure) of a stock is 2. The expected market return over the period is 10%, so that means that the market risk premium is 8% (10% - 2%) after subtracting the risk-free rate from the expected market return. Plugging in the preceding values into the CAPM formula above, we get an expected return of 18% for the stock:

18% = 2% + 2 x (10%-2%)

4.07 Application of Systematic and Unsystematic Risk

Unsystematic risk, also known as "specific risk," "diversifiable risk" or "residual risk," is the type of uncertainty that comes with the company or industry you invest in. Unsystematic risk can be reduced through diversification. For example, news that is specific to a small number of stocks, such as a sudden strike by the employees of a company you have shares in, is considered to be an unsystematic risk. **Systematic risk**, also known as "market risk" or "un-diversifiable risk", is the uncertainty inherent to the entire market or entire market segment. Also referred to as volatility, systematic risk consists of the day-to-day fluctuations in a stock's price. Volatility is a measure of risk because it refers to the behaviour, or "temperament," of your investment rather than the reason for this behaviour. Because market movement is the reason why people can make money from stocks, volatility is essential for returns, and the more unstable the investment the more chance there is that it will experience a dramatic change in either direction.

Interest rates, recession, and wars all represent sources of systematic risk because they affect the entire market and cannot be avoided through diversification. Systematic risk can be mitigated only by being hedged.

Systematic risk underlies all other investment risks. If there is inflation, you can invest in securities in inflation-resistant economic sectors. If interest rates are high, you can sell your utility stocks and move into newly issued bonds. However, if the entire economy underperforms, then the best you can do is attempted to find investments that will weather the storm better than the broader market. Popular examples are defensive industry stocks, for example, or bearish options strategies.

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. In other words, beta gives a sense of a stock's market risk compared to the greater market. Beta is also used to compare a stock's market risk to that of other stocks. Investment analysts use the Greek letter 'ß' to represent beta. Beta is used in the capital asset pricing model (CAPM), as we described in the previous section.

Beta is calculated using regression analysis, and you can think of beta as the tendency of a security's returns to respond to swings in the market. A beta of 1 indicates that the security's price will move with the market. A beta of less than 1 means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market.

Many utility stocks have a beta of less than 1. Conversely, most high-tech Nasdaq-based stocks have a beta greater than 1, offering the possibility of a higher rate of return, but also posing more risk.

Beta helps us to understand the concepts of passive and active risk. The graph below shows a time series of returns (each data point labelled "+") for a particular portfolio R (p) versus the market return R (m). The returns are cash-adjusted, so the point at which the x and y axes intersect is the cash-equivalent return. Drawing a line of best fit through the data points allows us to quantify the passive, or beta, risk, and the active risk, which we refer to as alpha.

R(p) = cash-adjusted portfolio return

ß (gradient)

$R(p) = ß*R(m) + a + e$

Each data point + represents a single point in a time series of returns

R(m) = cash-adjusted market return

a
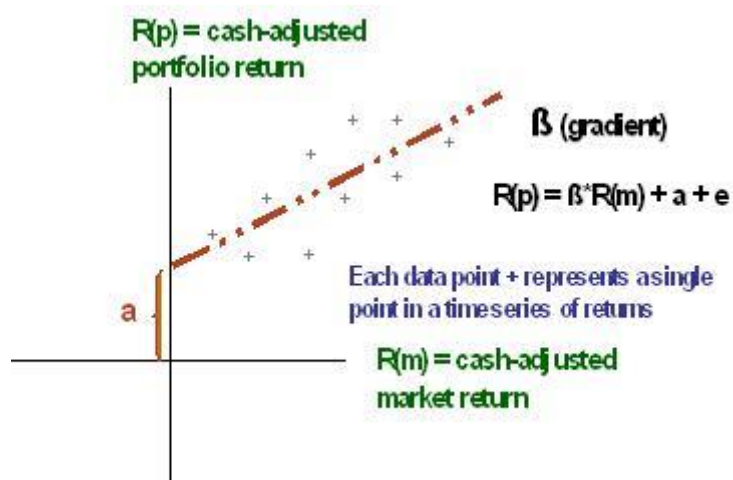
The gradient of the line is its beta. For example, a gradient of 1.0 indicates that for every unit increase of market return, the portfolio return also increases by one unit. A manager employing a passive management strategy can attempt to increase the portfolio return by taking on more market risk (i.e., a beta greater than 1) or alternatively decrease portfolio risk (and return) by reducing the portfolio beta below 1. Essentially, beta expresses the fundamental trade-off between minimizing risk and maximizing return. Let's give an illustration. Say a company has a beta of 2. This means it is two times as volatile as the overall market. Let's say we expect the market to provide a return of 10% on an investment. We

would expect the company to return 20%. On the other hand, if the market were to decline and provide a return of -6%, investors in that company could expect a return of -12% (a loss of 12%). If a stock had a beta of 0.5, we would expect it to be half as volatile as the market: a market return of 10% would mean a 5% gain for the company.

4.08   Arbitrage Pricing Model/Theory (APM/APT)

That CAPM is not always able to account for differences in assets returns using their beta, paved the way for the development of alternative approach called arbitrage pricing theory for estimating assets expected returns. Beta is considered the most important single factor in CAPM that captures the systematic risk of an asset. In APP, there are a number of industry – specific and microeconomic factors such as changes in GDP, inflation, interest rate etc that affects security returns.

Arbitrage pricing theory is an asset pricing model based on the idea that an asset's returns can be predicted using the relationship between that asset and many common risk factors. Created in 1976 by Stephen Ross, this theory predicts a relationship between the returns of a portfolio and the returns of a single asset through a linear combination of many independent macroeconomic variables.

BREAKING DOWN 'Arbitrage Pricing Theory - APT'
The arbitrage pricing theory (APT) describes the price where a mispriced asset is expected to be. It is often viewed as an alternative to the capital asset pricing model (CAPM), since the APT has more flexible assumption requirements. Whereas the CAPM formula requires the market's expected return, APT uses the risky asset's expected return and the risk premium of a number of macroeconomic factors. Arbitrageurs use the APT model to profit by taking advantage of mispriced securities, which have prices that differ from the theoretical price predicted by the model. By shorting an overpriced security, while concurrently going long in the portfolio the APT calculations were based on, the arbitrageur is in a position to make a theoretically risk-free profit.

Arbitrage Pricing Theory Equation and Example

APT states that the expected return on a stock or other security must adhere to the following relationship:

Expected return = r (f) + b (1) x rp (1) + b (2) x rp (2) + ... + b (n) x rp (n)

Where,

r (f) = the risk-free interest rate

b = the sensitivity of the asset to the particular factor

rp = the risk premium associated with the particular factor

The number of factors will range depending on the analysis. There can be a few or dozens; it depends on which factors an analyst chooses for the analysis. In addition, the exact factors do not have to be the same across analyses. As an example calculation, assume a stock is being analysed. The following four factors have been identified, along with the stocks sensitivity to each factor and the risk premium associated with each factor:

Gross domestic product growth: b = 0.6, rp = 4%

Inflation rate: b = 0.8, rp = 2%

Gold prices: b = -0.7, rp = 5%

Standard and Poor's 500 index return: b = 1.3, rp = 9%

The risk-free rate is 3%.

Using the above APT formula, the expected return is calculated as:

Expected return = 3% + (0.6 x 4%) + (0.8 x 2%) + (-0.7 x 5%) + (1.3 x 9%) = 15.2%

4.09   Review Questions

1.   Examine the assumptions underlying the capital asset pricing model. To what extent are the assumptions valid? (5marks)
2.   In the capital asset pricing model, security prices are said to be in equilibrium. Evaluate. (5marks)
3.   What is the implication of an investor operating on: (a) the section of the capital market line called the lending portfolio; and (b) on the section of the capital market line called the borrowing portfolio? (10marks)
4.   You are interested in the stock of Eagle Airline. You learn through your broker that the stock has a beta of 2.5. What is the implication of this risk-wise? If the expected return on the market portfolio is 18 percent and the risk-free rate of return is 6 percent, what would you expect as the return on the stock?(10marks)
5.   From among the stocks of the underlisted corporations, select the two most efficient stocks for inclusion in an investment portfolio.(10marks)

	Risk (%)	Expected Return (%)
BEF Industries Plc	12	6
Kigon Resources Plc	14	8
NAB Merchant Bank Plc	19	10
Organize Petro chemical Plc	21	16
Des Berger Construction Plc	12	8

6. Mr. Edy Nze has identified two stocks to form his portfolio. He intends to invest his savings in the two stocks on an equal basis. The first stock promises an expected return of 15%. Its standard deviation (o) is 5. The second stock has an expected return of 12% and a standard deviation of (o) of 3.5 what will be the risk of the two-stock portfolio if the coefficient of correlation of the first stock and the second stock is (a) 1.0, (b) -10 and (c) zero?(10marks)

7. Examine the most diversified portfolio. As you add more and more randomly selected securities in your portfolio.
(a) What happens to the portfolio variance?
(b) What conditions are necessary for the variance to diminish to zero as the number of securities becomes too large?
(c) Why do firms in the same industry tend to have a similar beta?(20marks)

MODULE 5

5.00   SOURCES OF FINANCE

5.01   Learning Outcomes

On successful completion of this module, students should be able to:
  i   Identify the various sources of finance.
  ii   Classify the sources of finance into short-term, medium-term and long-term.
  iii Examine the rationale for considering or employing each alternative source of finance.
  iv   Analyze the factors to be considered when raising finance through bank loan, debentures and preference share.
  v   Establish the various advantages and disadvantages of each source of finance.
  vi   Analyse equity/debt financial and associated risk
  vii Discuss the nature and role of capital market and the importance of internally generated funds.

5.02   Sources of Short-Term Finance
Short-term financing refers to financing originally scheduled for repayment within one year. There are various short-term methods that may be suitable for financing an envisaged short-fall in working capital. However, Short-term instruments of financing should not, if possible, be used to finance long-term investments.

The main sources of short-term funds are:
1.   Bank Credit (Bank overdraft)
2.   Commercial Papers
3.   Trade-Credits
4.   Debt Factoring
5.   Invoice Discounting
6.   Bills Discounting
7.   Accruals
8.   Acceptance Credits (Bankers Acceptances)
9.   Deferred Income
10.   Inventory Loans

 Bank Credit (Bank Overdraft)
Generally, deposit money banks in Nigeria grant their customers overdraft facilities in which case the customers are allowed to overdraw their current accounts up to a certain limit within a certain period, say a month or six months. Overdraft interest is charged on the day-to-day overdrawn balance. Bigger customers are sometimes charged "Prime Rate" i.e. a rate little above the bank's base rate. Overdraft interest/charges are tax deductible when filing tax returns to the appropriate tax authorities.

Bank overdrafts are usually extended to one year and can be rolled over if the facility is well managed by the customer. Overdraft facilities are granted based on the history of the customer with the bank. Therefore the greatest security for overdrafts is the integrity of the customer. Banks may use financial statements and projected cash flows to evaluate the credit-worthiness of customers. The main cost of bank overdraft is the interest charge. However, if an overdraft facility is not well managed, the Bank can recall the facility before its expiry date.

Commercial Paper

This is an instrument used to raise short-term funds from the money market. It is usually issued by an issuing house on behalf of the entity. In the past, this was done by merchant banks. The issuing house does not guarantee the notes but helps in finding investors to buy them. The investors in effect deal directly with the Entity issuing the notes. The issuing house charges a commission for the service, say 0.25%.

Commercial papers usually carry a coupon rate and the maturity date ranges between 30 and 270 days. The Securities and Exchange Commission Act stipulates that commercial papers with maturity dates of more than 270 days must be returned to the Securities and Exchange Commission.

The lists of commercial paper are composed of:
    1 The coupon rate, say 10% per annum
    2 An issuing house commission, usually 0.5% flat on the amount raised.

The finance manager of the entity has to compare this cost with the costs of other short-term sources before he will advise management of the entity to decide on this financing option.

Trade Credits

Trade Credit from suppliers is a major source of finance. It is beneficial to small and fast-growing entities. The costs of making maximum use of trade credit include:
    a.   The loss of suppliers' goodwill
    b.   Loss of any available cash discount for the early settlement of debts.

There are three types of trade credits arrangements used by entities. These are:
Open accounts, Notes payable, and Trade acceptances.

Also, various terms of sales are used in trade transactions some of which are discussed below:
    a.   Cash On Delivery (C.O.D) – This implies that goods will be paid on delivery. Thus, there is actually no trade credit. Rather, the seller bears the risk if the buyer refuses the shipment.
    b.   Cash Before Delivery (C.B.D.)- Here also, there is no trade credit and goods will be shipped only when paid for. The Entity may lose some turnover and a lot of profit if it insists on cash and carries sale terms.
    c.   End of the Month (E.O.M) – Here, trade credited is granted but payment is restricted to end of the month in which the goods are delivered.
    d.   Net period – No Cash Discount: This means that if the agreement provides like 30', or 'net 45,' it implies that the goods supplied must be paid not later than 30 days (or 45 days as the case may be) after the sales. There is no cash discount for paying earlier than 30 or 45 days.
    e.   Net Period – Cash Discount: This implies that in addition to extending credit, the seller may offer a cash discount if the bill is settled during the early part of the net period.

Trade credit is a valuable means of short-term finance because it is relatively easy to obtain, and it is also flexible. It is a continuous source of financing, though the amount varies with fluctuations in purchases. The entity always has some accounts payable. This is because as some accounts are settled, new purchases create new payables. Sometimes the entity may postpone settlement beyond the net period by leaning on the trade. This may generate additional short-term financing for the entity. This is at a cost and this cost must be considered before a decision is taken to stretch the accounts payable.

Factoring
A factor is defined as a 'doer or transactor of business for another'. But a factoring entity specializes in trade debts, and so manages the debts of a chant-business customer on the customer's behalf.
The International Institute for the Unification of Private Law (1983) defines factoring thus –
"Factoring is a contract by which the factor is to provide at least two of the services (finance, the maintenance of accounts, the collection of receivables and protection against credit risks) and the supplies is to assign to the factor on a continuity basis, by way of sales or security receivables from the sale of goods or services."
There are three main aspects of factoring:

i Administration of the client's debts involving sales accounting and debt collection service.
ii Credit protection for the client's debts whereby the factor takes over the risk of loss from bad debts and so insures so to say, the client against such losses. This is also known as 'debt under working' or the 'purchase of a client's debts'.
The factor usually buys these debts 'without recourse' to the client, which implies that in the event that the client's customers are unable to pay their debts, the factor will not revert to the client to pay him the money
Iii Making payments to the client in advance of collecting the debts. This is referred to as 'factor finance' because the factor is providing cash to the client as a prepayment of outstanding debts. The 'cash in advance' service is not always solicited for by the client this service attracts a different charge.

Factoring is, therefore, a source of short-term finance and also a means of managing and controlling debtors.

The Debts Administration Service (Factoring)
The administration of a client's debts by the factor covers:
i Keeping the books of account for sales, i.e. book-keeping service for the sales ledger
ii Sending out invoices to customers
iii Collecting the debts
iv Credit control (ensuring the customers pay on time, etc)

Although it is useful for professional accountants to understand the principles of factoring this is not a very important source of short-term finance for Nigerian Public Interest Entities because a large number of these entities sell goods to government and MDGs. Given the poor

payment record of MDGs, finance entities are reluctant to provide factoring services in respect of these debts.

Invoice Discounting

This arises in the following ways –
   i   Client sells goods to debtor
   ii   Client sells debts to factor
   iii   Factor makes immediate payment to the entity up to 80% of the face value of debts
   iv   Client collects debts as agent for factor
   v   Client repays advance from factor

Bills Discounting

A Bill of Exchange is usually prepare by the supplier of goods (creditor) for acceptance by the customer (debtor). This operates majorly in international; trade transactions. The supplier (seller) can obtain immediate cash after the goods have been dispatched by discounting the Bill with a Bank or Discount House. The discount market is still being developed in Nigeria.

Bankers Acceptance

This source of finance is similar to Bills of Exchange. The only difference is that it is a bank which guarantees/undertakes to settle the debt on maturity in case of default. Such a bill becomes readily discountable in the money market because a bank has accepted it. Bankers Acceptances are issued for periods ranging between 2 months and 12 months.

Deferred Income

It is a form of advancement by customers. It is an accepted practice in some industries to request customers to make advance payments or deposits for goods and services that a firm will deliver at a future date. These funds increase the entity's liquidity position. It is thus a good source of short-term financing.

Inventory Loans

Inventory backed loans are sources of short-term secured credits mostly from financial institutions. Examples of this are raw materials and finished goods inventories which are liquid assets and are, therefore, suitable as security for short-term loans. The resale value of the inventory and the ability of the lender to control the use of the inventory by the borrower are the critical factors that determine the suitability of this type of source of fund.

The various financing arrangements under this source of fund include, among others, the following:
   a. Floating lien
   b. Trust receipt
   c. Chattered mortgage
   d. Field warehouse receipt
   e. Terminal warehouse receipt

5.03   Sources of Medium Term Finance

The main sources of medium-term funds are
1.   Bank Term Loan

2.   Venture Capital
3.   Project Finance
4.   Equipment leasing
5.   Sale and Leaseback
6.   Hire Purchase

Bank Term Loan

A term loan, unlike the overdraft, is for a relatively longer period. As such, the conditionalities attached to a term loan are more than that of a bank overdraft. Usually, a bank would undertake a resource evaluation of the company that has applied to it for a loan facility and the project for which the facility is sought. When approved, the loan is released in stages as the project progresses. There is close supervision to ensure that the facility is not misapplied so as to protect the Bank interest and secure repayment of the facility.

Venture Capital

This represents funds invested usually in a new enterprise i.e. monies which are invested in a commercial venture with highly uncertain chances of success; hence they are referred to as risk capital and seed money. There are several stages involved in a venture capital funding. Seed money is needed to develop a concept (which may be a product or services) and a business plan.

The first needs of an enterprise are usually small and are funded by the entrepreneur's family and friends. This start-up or first-round financing is used to fund further research and development and formulate initial marketing and productive plans. Second- round financing is used to get production and selling efforts launched. When a company is producing and selling a product, that midway the company has cash flow challenges, the third round and subsequent rounds financing are used.

Project Finance

It is a self-liquidating facility and has the following characteristics
   a. The financial standing of the borrower is not important
   b. The proceeds from project should be sufficient to repay the capital together with the interest
   c. The project/project financed will serve as security.

Equipment Leasing

This is a financial arrangement to finance the procurement of an asset through a finance company or a leasing company or a bank. There are types of lease, namely-finance lease and operating lease. Under a finance lease, the risk and benefits of ownership is substantially transferred to the lessee. Conversely, in an operating lease arrangement, the risk and benefit of ownership remain with the lessor.

Sale and Leaseback

It is a situation where an asset previously owned by a company is sold and immediately repossessed through a leasing contract.

Hire Purchase (Vendor Credit)

This is an arrangement under which the hirer, in return for the use of an asset undertakes to make periodic payments to the owner of the asset. He is expected to assume ownership of the asset after the payment of the last installment.

5.04. Sources of Long-Term Finance

It is important to note that an organization must have long-term assets at its disposal for its operations. To acquire such long-term assets, it requires the sourcing of long-term finances. There are three major sources of long-term finances for incorporated companies:
  - i Equity Capital
  - ii Preference Share Capital
  - iii Debenture Stock Capital

Equity Capital – Ordinary Shares

Ordinary shares represent the ownership position in Public Interest Entities. Holders of ordinary shares are the legal owners of the Public Interest Entity. Ordinary shares remain the source of permanent capital since they do not have a maturity date.

Rights of an ordinary Shareholder

Individual owners of ordinary shares have **specific rights** as follows:
  - i. To attend and vote at the AGM - Annual General Meeting of the Entity or any such special meetings, which may be called.
  - ii. To sell his share certificates, thus in this way, transfer ownership interest to other persons.
  - iii. To inspect the books of the Entity have firsthand information
  - iv. To share in the profit of the Entity if cash dividends are declared and paid after satisfying the claims of other securities holders.
  - v. To share in the remaining assets of the Entity on Liquidation/Winding up.

In the same way, there are certain rights that are assigned to ordinary shareholders collectively. Some of the **collective rights** are:
  - i. To make or amend charts with the approval of the appropriate approving authority or the government MDG
  - ii. To authorize the sale of plant, property and equipment (PPE)
  - iii. To elect the members of the Board of Directors of the Entity
  - iv. To ratify mergers or other forms of re-structuring/re-organizations
  - v. To change the amount of authorized ordinary share capital
  - vi. To authorize Directors to appoint Independent Auditors and fix their remunerations.
  - vii. To authorize the issuance of preference shares, debentures, bonds and other securities.
  - viii. They enjoy the pre-emptive right, which empowers the existing ordinary shareholders the option to buy any additional issuance of ordinary shares in proportion to their current ownership status.

Advantages of ordinary shares

Some of the advantages of using ordinary shares are:

i. No continuous fixed charges are incurred by the Entity. It can only pay dividends to ordinary shareholders if the entity makes profit, include debt financing which entitles the holders to fixed income irrespective of whether the Entity makes a profit or not.

ii. There is no maturity date for ordinary shares unlike other securities like Debentures, Bonds etc which must be redeemed at maturity.

iii. Ordinary shares increase the credit worthiness of the Entity because they provide a cushion against houses for creditors. Their liability is unlimited on liquidation.

iv. Sometimes, ordinary shares are more attractive than debt. They appeal more to a certain group of investors because of their equity status and the prospect of getting higher returns when the entity is doing well.

v. Ordinary shareholders enjoy a lower rate of tax on their returns on capital gains.

Disadvantages of ordinary shares

Equity financing has the following disadvantages:

i. Dilutions of control through voting of new shares are sold to outsiders.

ii. The new shareholders participate fully in profits and dividend, unlike debt securities.

iii. Fluctuation costs of new shares are relatively higher than other securities.

iv. Ordinary shares dividend are not tax deductible unlike interest on Bond. This, therefore, makes equity to be more expensive than debt capital.

Raising of equity capital

When Public Interest Entities want to raise additional equity funds, they go to the capital market. Some of the methods used in raising equity funds are:

i. Stock exchange Introduction: This is not a method of raising new capital but a way of getting permission to introduce the shares of the entity to the market.

ii. Offer for sale: in this method, the shares are offered to the public including the existing shareholders through an issuing house. Proceeds from sales go to the vendor (existing shareholders) and not the entity. This is not a fresh issue of shares. This method was used by the Bureau of Public Enterprises (EPE) to sell the Federal Government's shares in the Privatized Enterprise.

iii. Offer for sale by Subscription: In this method, the entity through the agency of an Issuing House offers fresh issues to the public. The objective is to raise additional capital for the entity. The proceeds to the Entity and the number of shares outstanding at the end of the exercise will increase. This is first shares by a private entity to the public is known as initial sale of shares by a private entity to the public is known as Initial Public Offer (IPO). IPOs are normally issued by smaller, younger private entities seeking capital to expand. Privately owned ~~large~~ entities can as well use this method to go public.

iv. Offer for Sale by Tender: The Entity offers the shares for sale at a minimum price level. Applications are requested for the sale of the shares at prices determined by various investors. The striking price-final price will be determined by various investors. The stock exchange will ensure that all used to clear all the shares. The stock exchange will ensure that all shares are finally taken up at the same price.

v. Private Placement: Under this method, the shares are offered to a specific group of investor's usually insurance companies, pension funds, or any other institutional investors. Private placement has the following advantages.

1 Size – it is helpful to issue a small amount of funds
2 Cost – it is less expensive compared to the public issue
3 Speed – it takes less time to raise funds through private placement less than 3 months, unlike public issues.

Rights issue of ordinary shares

A rights issue involves the selling of ordinary shares to the existing shareholders of the entity. The new original shares are issued to the existing shareholders first on a pro rata basis. Shareholders who renounce their rights are not entitled to additional shares. Shares that are now available as a result of those rights not taken up are allotted to shareholders who have applied for additional shares on pro-rata basis. Any balance of shares left after issuing the additional shares can be sold in the open market.

Merits and demerits of rights issue
Merits
i   The existing shareholder's control is maintained through the pro rata issue of shares
ii Raising funds through the sale of rights issue rather than the public issue involves less floatation costs as the entity can avoid underwriting commission.

Demerits
i Shareholders who fail to exercise their rights lose in terms of decline in their wealth.

Preference shares
Preference share is often considered to be a hybrid security since it has many features of both ordinary shares and debentures.

Similarities to Ordinary Shares:
i   Nonpayment of dividends does not force the entity to insolvency
ii Dividends are not deductible for tax purposes
iii In some cases, it has no fixed maturity.

Similarities to Debentures:
i   Dividend rate is fixed
ii Preference shareholders do not participate in residual profits
iii Preference shareholders have claims on profit and assets prior to ordinary shareholders
iv Usually, they do not have voting rights.

Features
Preference shares have several features. Some of the features are common to all while others are specific to some

i   **Claims on profits and assets:** Preference shares are senior security compared to ordinary shares. Has prior claim on the company's profits. They are paid dividends before ordinary shares. Have prior claims on a company's assets in the event of liquidation. They are next to debentures.
   a. Preference shares are less risky than ordinary shares. Preference shareholders do not have voting rights. A company can, if it wishes, issue Participative Preference Shares.

ii   **Fixed dividend:** The dividend rate is fixed e.g. 10% preference shares. Preference dividends are not tax deductible and are called fixed income security because it provides constant income to holders. As in ordinary shares, payment of dividend to preference shareholders is not a legal obligation

iii   **Cumulative dividend:** Some preference shares have a cumulative dividend feature. Nonpayment of preference dividend does not result in insolvency. The cumulative feature protects the rights of preference shareholders.

iv   **Redemption** – Redeemable preference shares have a specified maturity date.

v   **Sinking fund** – Just like in the case of Debentures, a sinking fund may be created to redeem preference shares on maturity. However, it should be noted that sinking funds for preference shares are not common.

vi   **Call** – The Call feature permits the company to buy back preference shares as at a stipulated call price. This price may be higher than the par value. The difference between call price and par value is called call premium.

vii   **Voting right** – preference shares do not have voting rights.

viii   **Convertibility**- Preference shares may be convertible or non-convertible.

Advantages of preference shares

Preference shares have certain advantages for the company. Some of them are:
   i   **Riskless leverage advantage**: Preference shares provide financial leverage advantages since preference dividend is a fixed obligation.
   ii   **Dividend postponement** – payment of preference dividend can be postponed without risk.
   iii   **Fixed Dividend** – Preference dividend payments are restricted to the stated amount. Holders do not participate in excess profits as do the ordinary shareholders.
   iv   **Commitment To Pay Dividend** – Non-payment of preference dividends can adversely affect the image of the company because equity holders cannot be paid any dividends unless preference shareholders are paid.

    v   **Dividends** – Preference shares provide more flexibility and lesser burden to a company. Dividend rate is less than on equity and it is fixed. When an entity reorganizes its capital, it may convert preference capital to equity.

Debentures

A debenture is a long-term promissory note for raising loan capital. The entity promises to pay interest and principal as stipulated. The purchases of debentures are called debenture holders. Debentures have the following features

    i   Debenture holders are not entitled to voting rights

    ii   Debentures are fixed interest securities entitled to annual interest payments

    iii The interest elements are deductible. This interest rate is fixed and known

    iv Debentures could be redeemable, irredeemable or convertible.

       The principal amounts are usually secured on the assets of the company and could have a floating charge or a fixed charge or a combination of floating and fixed.

A floating charge covers all the assets as they exist from time to time excluding assets subjected to a fixed charge.

A fixed charge is on one or more specific asset. If the company defaults in the payment of interest, or principal, or attempts to sell an asset charged, a receiver may be appointed take possession of the asset and sell it for the benefits of the debenture holders.

Redemption of Debentures

 A debenture holder may redeem the debenture earlier than the due date because of any of the following reasons

    i   To take advantage of falling

    ii   To make use of surplus funds

    iii To release assets covered by a fixed charge for usage as collated.

Redemption of debentures can be accomplished either through a sinking fund or buy-back (call) provision

Sinking fund: a sinking fund is a cash set aside periodically for retiring debentures. The fund is under the control of the trustee who redeems the debentures periodically. The periodic retirement of debt through the sinking funds reduces the amount required to redeem the remaining debt at maturity.

Indenture: an indenture or debenture trust deed is a legal agreement between the company issuing debentures and the debenture trustee who represents the debenture holders the duty of the debenture trustee is to protect the interest of debenture holders. The debenture trustee deed (indenture) provides specific terms of the agreement – description of debentures, rights of debenture holders, rights of the issuing company and duties of a trustee.

Claims on assets and profits: debenture holders have a claim on the company's profits prior to that of the shareholders (ordinary and preference). Debenture interest is to be charged before determining the profits, and as such before paying any dividends to preference and

ordinary shareholders. In liquidation, the debenture holders, claim rank before any other group on the assets of the company.

Financial Sweeteners: this refers to equity, options, such as warrants or conversion privileges, attached to a debt security.

Merit and Demerits of Debentures
Debentures have some advantages as a long-term source of finance. These are in the form of:
i   **Less costly** – it involves less cost to the company than the equity financing because investors consider debentures to be less risky investment option.
ii **Ownership dilution** – debenture holders do not have voting rights. Therefore, debenture issuance does not cause dilution of ownership.
iii **Fixed payment of interest** – their payments are limited to interest only as they do not participate in extraordinary profits of the company.
iv **Reduced real obligation** – During high inflationary periods, a company's obligation of payment interest and principal which are fixed decline in real terms.
v   However, the disadvantages of debentures include:
vi **Obligatory payments** – Debentures results in legal obligations of payment of interest and principal which, if not settled, can force the company to go into liquidation.
vii **Financial risk** – It increases the company's financial leverage. This may be injurious to companies which have fluctuating turnover and earnings.
viii **Cash outflows** - Debentures must be redeemed on maturity and at some points. This involves substantial cash outflows which may impact negatively on the liquidity position of the company.
ix **Restricted covenants** – Debenture indenture may contain restrictive covenants which may limit the company's operating flexibility in future.

5.05   Factors that Affect a Company's Choice of Finance
The decision to raise finance by use of liquidity or debt to finance the operations of a company will depend on a number of factors. Some of these are:
i   **Length of the project** - The general rule in financing is that the maturity of the finance should match the length of the project it is to be used for. Therefore, a long-term investment requires a long-term finance. This is to avoid mismatch of funds.
ii **Pattern of cash flow** – The best source of finance in terms of liquidity is equity because the annual dividend can be small or zero and can be varied to suit prevailing circumstances.
iii **Level of risk** – A project with a high level of risk will probably require some form of equity finance.
iv **Cost of finance** – A company should seek to minimize the cost of finance it raises. This is very important because the cost of finance would invariably affect the value of the company.
v   **Debt capacity** – the company should asses its capacity to use debt to finance project given the value of the project in terms of its suitability as security for the loan.

vi   **Control** – existing shareholders will be willing to maintain their level of control over an organization if retained earnings or rights issues are used for finance.

5.06   Equity/Debt Financial and Associated Risks

Debt/Equity Ratio is a debt ratio used to measure a company's financial leverage, calculated by dividing a company's total liabilities by its stockholders' equity. The D/E ratio indicates how much debt a company is using to finance its assets relative to the amount of value represented in shareholders' equity.

The formula for calculating D/E ratios can be represented in the following way:

Debt - Equity Ratio = Total Liabilities / Shareholders' Equity

The result may often be expressed as a number or as a percentage.

This form of D/E may often be referred to as risk or gearing.

This ratio can be applied to personal financial statements as well as corporate ones, in which case it is also known as the Personal Debt/Equity Ratio. Here, "equity" refers not to the value of stakeholders' shares but rather to the difference between the total value of a corporation or individual's assets and that corporation or individual's liabilities. The formula for this form of the D/E ratio, then, can be represented as:

D/E = Total Liabilities / (Total Assets - Total Liabilities)

BREAKING DOWN 'Debt/Equity Ratio'

Given that the debt/equity ratio measures a company's debt relative to the total value of its stock, it is most often used to gauge the extent to which a company is taking on debts as a means of leveraging (attempting to increase its value by using borrowed money to fund various projects). A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. Aggressive leveraging practices are often associated with high levels of risk. This may result in volatile earnings as a result of the additional interest expense.

For example, suppose a company has a total shareholder value of N180,000 and has N620,000 in liabilities. Its debt/equity ratio is then 3.4444 (N620,000 / N180,000), or 344.44%, indicating that the company has been heavily taking on debt and thus has high risk. Conversely, if it has a shareholder value of N620,000 and N180,000 in liabilities, the company's D/E ratio is 0.2903 (N80,000 / N620,000), or 29.03%, indicating that the company has taken on relatively little debt and thus has low risk.

If a lot of debt is used to finance increased operations (high debt to equity), the company could potentially generate more earnings than it would have without this outside financing. If this were to increase earnings by a greater amount than the debt cost (interest), then the

shareholders benefit as more earnings are being spread among the same amount of shareholders. However, if the cost of this debt financing ends up outweighing the returns that the company generates on the debt through investment and business activities, stakeholders' share values may take a hit. If the cost of debt becomes too much for the company to handle, it can even lead to bankruptcy, which would leave shareholders with nothing.

The personal debt/equity ratio is often used in financing, as when an individual or corporation is applying for a loan. This form of D/E essentially measures the dollar amount of debt an individual or corporation has for each dollar of equity they have. D/E is very important to a lender when considering a candidate for a loan, as it can greatly contribute to the lender's confidence (or lack thereof) in the candidate's financial stability. A candidate with a high personal debt/equity ratio has a high amount of debt relative to their available equity, and will not likely instil much confidence in the lender in the candidate's ability to repay the loan. On the other hand, a candidate with a low personal debt/equity ratio has relatively low debt, and thus poses much less risk to the lender should the lender agree to provide the loan, as the candidate would appear to have a reasonable ability to repay the loan.

Limitations of 'Debt/Equity Ratio'

Like with most ratios, when using the debt/equity ratio it is very important to consider the industry in which the company operates. Because different industries rely on different amounts of capital to operate and use that capital in different ways, a relatively high D/E ratio may be common in one industry while a relatively low D/E may be common in another. For example, capital-intensive industries such as auto manufacturing tend to have a debt/equity ratio above 2; while companies like personal computer manufacturers usually are not particularly capital intensive and May often have a debt/equity ratio of under 0.5. As such, D/E ratios should only be used to compare companies when those companies operate within the same industry.

Another important point to consider when assessing D/E ratios is that the "Total Liabilities" portion of the formula may often be determined in a variety of ways by different companies, some of which are not actually the sum of all of the company's liabilities. In some cases, companies will only incorporate debts (like loans and debt securities) into the liabilities portion of the formula, while omitting other kinds of liabilities (unearned revenue, etc.). In other cases, companies may calculate D/E in an even more specific way, including only long-term debts and excluding short-term debts and other liabilities. Yet, "long-term debt" here is not necessarily a term with a consistent meaning. It may include all long-term debts, but it may also exclude long-term debts nearing maturity, which are then categorized as "short-term" debts. Because of these differentiations, when considering a company's D/E ratio one should try to determine how the ratio was calculated and should be sure to consider other ratios and performance metrics as well.

5.07   Nature and Importance of Internally Generated Fund

       Internal Funds as Source of Finance

Internal finance is also known as self-financing by a company. **Internal finance** includes the funds generated within the corporate unit irrespective of the nature of the source.

In other words the extent of profitability after tax, the size of dividend payments and the amount of depreciation provided for along with the reserves and surplus all contribute to the sources of internal funds and these funds can be used by a company financing the cost for acquisition of fixed assets, expansion modernization or diversification, etc.

There exists a controversy whether depreciation should be taken as a source of finance. Whatever may be the outcome of such controversy, the fact remains that the depreciation is a sum that is set apart out of profits and retained within the business and finance the capital needs in the normal business routine, and as such depreciation in a true academic sense be deemed as a source of internal finance.

Sources of Total Finance

i   Paid-up Capital – Equity and Preference
ii Reserves and Surplus – Including Share Premium
iii Secured Loans
iv Unsecured Loans
v   Current Liabilities and Provisions
vi Depreciation Provision

Sources of Internal Finance

i   Bonus issue and shares paid-up
ii Bonus issue of preference shares
iii Reserves and Surpluses
iv Provision including provisions for depreciation

Depreciation as Source of Finance

Among all the sources of internal finance, the main source is depreciation on an average as revealed by some research studies done by research scholars. The second source is reserves and surplus and lastly the bonus issue of preference shares or equity shares.

As regards depreciation, the term denotes the funds set apart for replacement of worn-out assets. Depreciation is a deduction out of profits of the company calculated as per accounting rules on the basis of the estimated life of each asset each year to total over the life of the assets to an amount equal to the original value of the assets.

Although depreciation is meant for replacement of particular assets but generally it creates a pool of funds which are available with a company to finance its working capital requirements and sometimes for the acquisition of new assets including replacement of worn-out plant and machinery.

5.08 Review Questions

1. Discuss the various types of debentures.(5marks)
2. Discuss the main provisions contained in an indenture of a bond issue. (5marks)
3. Why is preference shares referred to as hybrid stocks? (5marks)
4. Discuss the advantages and disadvantages of preference shares to the issuing company. (5marks)
5. Discuss term loan and features of term loan. (5marks)
6. Discuss the internal sources of finance(5marks)
7. What, in your opinion, is the best source of finance? Justify your answer. (5marks)
8. What are the factors that influence a company's choice of source of finance? (5marks)
9. What are the risks associated with each source of finance? (5marks)
10. What is a rights issue and what are its merits and demerits? (5marks)

MODULE 6

6.00 FINANCIAL MARKETS

6.01 Learning Outcomes

On successful completion of this module, students should be able to:
  i   Discuss financial markets.
  ii Identify the principal players in Nigerian financial markets.
  iii Make a clear distinction between the money market and the capital market and their separate instruments.
  iv Enumerate the factors to be considered when raising finance through the issue of loan stocks, preference shares, and ordinary shares.
  v   Analyse and evaluate the theories of the financial market.

6.02   Money Markets

The money market is where short-term and liquid (or near-liquid) financial instruments are created, sourced and traded with the Central Bank of Nigeria (CBN) acting as the market regulator. The securities traded in the market each has a tenure of one year or less. Instruments traded in the money market are characterized by low level of return, high degree of safety (i.e. 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), banker's acceptances (BAs) and Commercial Papers (CPs).
The characteristics of each of these instruments are discussed as follows:

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 N1,000 and are sold on an auction basis. They have 91 days, 182 days and 365 days maturity and are sold at a discount to their face or par value.

CBN Certificate

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.

Commercial Bank 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.

Certificate of Deposit

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.

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".

Banker's Acceptances have three parties – the drawer, the drawee, and the 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. Banker's acceptances are bought and sold on a discount basis.

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 – the promisor and the promise. A bank only comes in as an agent of either party or both parties.

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

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

Advantages of money markets

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 organizations.

c. Institutional Structure:
The organizational arrangements, in terms of market and the participating institutions are good.

Disadvantages of money markets
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.

6.03 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 markets 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 and each has its own distinct and unique characteristics, hence the description 'capital markets' (and not capital market).

6.04   Functions of Financial Markets

Financial markets create an open and regulated system for companies to obtain large amounts of financial capital to grow their businesses. This is done through the stock and bond markets. Markets also allow these businesses to offset risk with commodities and foreign exchange futures contracts, as well as other derivatives.

Since the markets are public, they provide an open and transparent way to set prices on everything traded. These prices assume that all available knowledge about everything traded is taken into consideration. This reduces the cost of getting information, because it is incorporated into the price.

The sheer size of the financial markets provides liquidity. In other words, sellers can easily unload assets whenever they need to raise cash. The size also reduces the cost of doing business, since companies don't have to go far to find a buyer, or someone willing to sell. (Source: Iowa State University, Six Basic Functions of Financial Markets).

1. Mobilisation of Savings and their Channelization into more Productive Uses:

The financial market gives impetus to the savings of the people. This market takes the uselessly lying finance in the form of cash to places where it is really needed. Many financial instruments are made available for transferring finance from one side to the other side. The investors can invest in any of these instruments according to their wish.

2. Facilitation on Price Discovery

The price of any goods or services is determined by the forces of demand and supply. Like goods and services, the investors also try to discover the price of their securities. The financial market is helpful to the investors in giving them the proper price.

3. Provision of Liquidity to Financial Assets

This is a market where the buyers and the sellers of all the securities are available all the times. This is the reason that it provides liquidity to securities. It means that the investors can invest their money, whenever they desire, in securities through the medium of the financial market. They can also convert their investment into money whenever they so desire.

4. Reduction of the Cost of Transactions
Various types of information are needed while buying and selling securities. Much time and money are spent in obtaining the same. The financial market makes available every type of information without spending any money. In this way, the financial market reduces the cost of transactions.

5. Pooling of Funds

In a financial system, the Savings of people are transferred from households to business organizations. With these production increases and better goods are manufactured, which increases the standard of living of people.

6. Capital Formation

Business requires finance. These are made available through banks, households and different financial institutions. They mobilize savings which leads to Capital Formation.

7. Facilitation of Payment

The financial system offers convenient modes of payment for goods and services. New methods of payments like credit cards, debit cards, cheques, etc. facilitate quick and easy transactions.

8. Provision of Liquidity

In the financial system, liquidity means the ability to convert into cash. The financial market provides the investors the opportunity to liquidate their investments, which are in instruments like shares, debentures, bonds, etc. Price is determined on the daily basis according to the operations of the market forces of demand and supply.

9. Short and Long Term Needs

The financial market takes into account the various needs of different individuals and organizations. This facilitates optimum use of finances for productive purposes

10. Risk Function

The financial markets provide protection against life, health, and income risks. Risk Management is an essential component of a growing economy.

11. Better Decisions

Financial Markets provide information about the market and various financial assets. This helps the investors to compare different investment options and choose the best one. It helps in decision making in choosing portfolio allocations of their wealth.

12. Financing Government Needs

The government needs a huge amount of money for the development of defence infrastructure. It also requires finance for social welfare activities, public health, education, etc. This is supplied to them by financial markets.

13. Economic Development

India is a mixed economy. The Government intervenes in the financial system to influence macroeconomic variables like interest rate or inflation. Thus, credits can be made available to corporate at a cheaper rate. This leads to economic development of the nation.

6.05   Nature and Role of Capital Markets

According to Olowe (1998), the capital market of any given nation gives an idea of the state of health of the national economy. It measures the stability of the economy with regards to the extent to which economic activities can rely on it. Essentially, the level of national economic development and the extent to which most economic activities can effectively rely on the safety of the capital market are major indicators of a healthy balance between a sound financial system and macroeconomic stability. It is in the light of these assumptions that the capital market performs several roles and functions.

Functions of the Capital Market

The capital market performs several functions in any economy. These include:

a. Financial interface and intermediation between surplus-spending institutions and deficit-spending institutions,
b. Offering enterprises new and wider opportunities for obtaining funds.
c. Acting as a means of exchanging securities at mutually beneficial terms thereby creating liquidity through the pricing mechanism.
d. Acting as means of ascertaining security prices
e. Acting as an easily accessible means of efficiently trading in securities
f. Allocating and rationing funds among competing demand and uses.

Roles of the Capital Market in Economic Development

The capital market plays the following important roles in the economic development process:

i   Providing a means of raising long-term finance to assist companies to expand and modernize;
ii   Providing a means of allocating the nation's real and financial resources between various industries and companies;
iii Providing liquidity for investment funds from the standpoint of the individual and the economy;
iv   Serving as a measure of confidence in the economy and as an important economic barometer;
v   Providing industrial management with some idea of the current cost of capital through its pricing mechanism, an important issue in determining the level and rate of investment;
vi   Acting as a reliable medium for broadening the ownership base of erstwhile family-dominated firms;
vii Providing an avenue for marketing of securities in order to raise fresh funds for expansion;
viii Encouraging inflow of foreign capital when foreign companies or investors invest in domestic securities;
ix   Providing facilities for foreign businesses to offer their shares to Nigerian investors thereby giving Nigerians ownership stake in foreign companies;

   x   Providing the opportunities for government to finance economic development-oriented projects;

  xi Creating an avenue for government to privatize its erstwhile state-owned companies;

 xii Encouraging transparency and good accounting and management practices through adequate disclosure of relevant and adequate information for investors to make well-informed decisions;

xiii Providing needed seed money for venture capital development which often serves as a vehicle for industrial growth and development (SEC, Abuja, 2006)

The Capital Market currently aids the Nigerian economy:

   i   By promoting small and medium-sized industries through the second-tier Security Market.

  ii By promoting a bonds market to specifically cater for domestic national debts through the securitization of the domestic national debt. This makes the debts negotiable via the Debt Management Office of Nigeria and helps to provide liquidity to lenders who would wish to encase their bonds.

 iii Through funding the activities of listed companies by Initial Public Offers, Public Offers, and Private Placements.

 iv Through financing upstream and downstream activities in the oil and gas industry, specifically hydrocarbons (petrochemicals and liquefied natural gas).

  v Through the privatization and commercialization of government-controlled enterprises by an offer for sale or subscription in the capital market.

 vi Through the promotion of commodities exchanges to facilitate liquidity for agricultural products in an organized market.

 vii Through the internationalization of the capital market by cross-border listings and cross-listings on other stock on all securities listed on the Nigerian Stock Exchange to the international community. This encourages foreign inflow of capital through enquiries.

In summary, the significance of the capital market lies in the fact that it is where the value of a business can be assessed through the price of its stock. Changes in the ownership of businesses take place through the purchase and/or sale of stock, and businesses (as well as government) raise new capital and tests their support in the broader business community by selling stock at a given price. Kidron and Segal succinctly put it that the capital market is the only forum where speculation and gambling take place legitimately.

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. The following are the characteristics of government securities:

Issuing prices: These are usually in units of N1000 and at so much percent. The N1000 represents the nominal or par value of the security.

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 grate.

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.

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

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 in 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.

Advantages and Disadvantages

Government-quoted securities have the following advantages and disadvantages.

Advantages

i.   **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.
ii. **Security of income:** Income is also secured as default in paying interest is not expected from government.
iii. **Liquidity:** Being a quoted security, there is a market where disposal can take place if there is a need for cash.

Disadvantages

i. **Risk:** Being a quoted security which has a price that could fluctuate, there is some element of risk-the interest rate risk.
ii. **Inflation:** Both income streams and capital values may be eroded by inflation risk.

Capital Markets

Capital markets are markets for buying and selling equity and debt instruments. Capital markets channel savings and investment between suppliers of capital such as retail investors and institutional investors, and users of capital like businesses, government, and individuals. Capital markets are vital to the functioning of an economy since capital is a critical component for generating economic output. Capital markets include primary markets, where new stock and bond issues are sold to investors, and secondary markets, which trade existing securities.

BREAKING DOWN 'Capital Markets'

Capital markets are a broad category of markets facilitating the buying and selling of financial instruments. In particular, there are two categories of financial instruments that capital in which markets are involved. These are equity securities, which are often known as stocks, and debt securities, which are often known as bonds. Capital markets involve the issuing of stocks and bonds for medium-term and long-term durations, general terms of one year or more.

Capital markets are overseen by the Securities and Exchange Commission in the United States or other financial regulators elsewhere. Though capital markets are generally concentrated in financial centres around the world, most of the trades occurring within capital markets take place through computerized electronic trading systems. Some of these are accessible by the public and others are more tightly regulated.

Other than the distinction between equity and debt, capital markets are also generally divided into two categories of markets, the first of which being primary markets. In primary markets, stocks and bonds are issued directly from companies to investors, businesses and other institutions, often through underwriting. Primary markets allow companies to raise capital without or before holding an initial public offering so as to make as much direct profit as possible. After this point in a company's development, it may choose to hold an initial public offering so as to generate more liquid capital. In such an event, the company will generally sell its shares to a few investment banks or other firms.

At this point, the shares move into the secondary market, which is where investment banks, other firms, private investors and a variety of other parties resell their equity and debt securities to investors. This takes place on the stock market or the bond market, which take place on exchanges around the world, like the New York Stock Exchange or NASDAQ; though it is often done through computerized trading systems as well. When securities are resold on the secondary market, the original sellers do not make money from the sale. Yet, these original sellers will likely continue to hold some amount of stake in the company, often in the form of equity, so the company's performance on the secondary market will continue to be important to them.

Capital markets have numerous participants including individual investors, institutional investors such as pension funds and mutual funds, municipalities and governments, companies and organizations, banks and financial institutions. While many different kinds of groups, including governments, may issue debt through bonds (these are called government bonds), governments may not issue equity through stocks. Suppliers of capital generally want

the maximum possible return at the lowest possible risk, while users of capital want to raise capital at the lowest possible cost.

The size of a nation's capital markets is directly proportional to the size of its economy. The United States, the world's largest economy, has the largest and deepest capital markets. Because capital markets move money from people who have it to organizations who need it in order to be productive, they are critical to a smoothly functioning modern economy. They are also particularly important in that equity and debt securities are often seen as representative of the relative health of markets around the world.

On the other hand, because capital markets are increasingly interconnected in a globalized economy, ripples in one corner of the world can cause major waves elsewhere. The drawback of this interconnection is best illustrated by the global credit crisis of 2007-09, which was triggered by the collapse of U.S. mortgage-backed securities. The effects of this meltdown were globally transmitted by capital markets since banks and institutions in Europe and Asia held trillions of dollars of these securities.

In finance, a convertible bond or convertible note or convertible debt (or a convertible debenture if it has a maturity of greater than 10 years) is a type of bond that the holder can convert into a specified number of shares of common stock in the issuing company or cash of equal value. It is a hybrid security with debt- and equity-like features. It originated in the mid-19th century and was used by early speculators such as Jacob Little and Daniel Drew to counter market cornering. Convertible bonds are most often issued by companies with a low credit rating and high growth potential.

To compensate for having additional value through the option to convert the bond to stock, a convertible bond typically has a coupon rate lower than that of similar, non-convertible debt. The investor receives the potential upside of conversion into equity while protecting downside with cash flow from the coupon payments and the return of principal upon maturity. These properties lead naturally to the idea of convertible arbitrage, where a long position in the convertible bond is balanced by a short position in the underlying equity.

From the issuer's perspective, the key benefit of raising money by selling convertible bonds is a reduced cash interest payment. The advantage for companies of issuing convertible bonds is that, if the bonds are converted to stocks, companies' debt vanishes. However, in exchange for the benefit of reduced interest payments, the value of shareholder's equity is reduced due to the stock dilution expected when bondholders convert their bonds into new shares.

Warrant

A warrant is a derivative that confers the right, but not the obligation, to buy or sell a security – normally an equity – at a certain price before expiration. The price at which the underlying security can be bought or sold is referred to as the exercise price or strike price. An American warrant can be exercised at any time on or before the expiration date, while

European warrants can only be exercised on the expiration date. Warrants that confer the right to buy a security are known as call warrants; those that confer the right to sell are known as put warrants.

BREAKING DOWN 'Warrant'

Warrants are in many ways similar to options, but a few key differences distinguish them. Warrants are generally issued by the company itself, not a third party, and they are traded over-the-counter more often than on an exchange. Investors cannot write warrants like they can options. Unlike options (with the exception of employee stock options), warrants are dilutive: when an investor exercises her warrant, she receives newly issued stock, rather than already-outstanding stock. Warrants tend to have much longer periods between issue and expiration than options, of years rather than months.

Warrants do not pay dividends or come with voting rights. Investors are attracted to warrants as a means of leveraging their positions in a security, hedging against downside (for example, by combining a put warrant with a long position in the underlying stock) or exploiting arbitrage opportunities.

Warrants are no longer very common in the U.S., but are heavily traded in Hong Kong, Germany, and other countries.

Types of Warrants

Traditional warrants are issued in conjunction with bonds, which in turn are called warrant-linked bonds, as a kind of sweetener that allows the issuer to offer a lower coupon rate. These warrants are often detachable, meaning that they can be separated from the bond and sold on the secondary markets before expiration. A detachable warrant can also be issued in conjunction with preferred stock; often the warrant must be sold before the investor can collect dividends.

Wedded or wedding warrants are not detachable, and the investor must surrender the bond or preferred stock the warrant is "wedded" to in order to exercise it. Naked warrants are issued on their own, without accompanying bonds or preferred stock.

Covered warrants are issued by financial institutions rather than companies, so no new stock is issued when covered warrants are exercised. Rather, the warrants are "covered" in that the issuing institution already owns the underlying shares or can somehow acquire them. The underlying securities are not limited to equity, as with other types of warrants, but may be currencies, commodities or any number of other financial instruments.

Trading warrants can be difficult and time-consuming, as they are for the most part not listed on stock exchanges, and data on warrant issues are not readily available for free. When a warrant is listed on an exchange, its ticker symbol will often be the symbol of the company's common stock with a W added to the end. For example, Abeona Therapeutics Inc's (ABEO)

warrants are listed on Nasdaq under the symbol ABEOW. In other cases, a Z will be added, or a letter denoting the specific issue (A, B, C…).

Warrants generally trade at a premium, which is subject to time decay as the expiration date nears. As with options, warrants can be priced using the Black-Scholes model.

6.06   Capital Market Efficiency

The efficient market concept models the market in terms of market reaction to the flow of information. A stock market is said to be efficient if security prices reflect all available information. Here efficiency refers to informational efficiency which is a measure of the relationship between information and the security market. This is contrasted with production efficiency which is a property of how production is organized or the exchange efficiency which relates to the consumption market. If the security market is efficient, it is implied that information is widely and cheaply available to investors and that all relevant and ascertainable information are already reflected in the security prices. It is also implied that security prices adjust very rapidly to new information. But if prices always reflect all available information, the price will change only when new information arrives. As new information (which by definition is not predictable ahead of time) is learned, it is instantaneously assimilated by the market and a new price is established. So anytime a new piece of relevant information is released the intrinsic value of the affected stock will change and the stock market will adjust towards the new value.

The efficient stock market can be said to be in continuous equilibrium, in which the intrinsic value of securities vibrate randomly and in which the market price always equates the underlying intrinsic value at any point in time. If at any time, the market price of a security is not equal to the intrinsic value, it then means that the stock market is not perfectly efficient. But if the market is perfectly efficient, all prices will be fair prices and investment returns would always be what would be expected for the risk assumed. Also because market prices are used to allocated resources among competing ends, an inefficient capital market will lead to misallocation of investment capital to the detriment of the national economy.

The efficient markets hypothesis is based on a number of assumptions about the environment in which the stock market operates. Specifically, it assumes a perfect market. Implied in this assumption is that the stock market is made up of a large number of independent and rational buyers and sellers, who try to maximize profits by predicting future market values of individual securities. Also implied is that the market is activated by many independent security traders none of whose operation is large enough to influence prices. This means that even the few institutional investors that are large enough to influence prices are restricted by regulations from manipulating prices.

Another assumption of the perfect market presumed by the hypothesis is that the product, in this case, the securities are homogeneous. For example, every share of, for instance, UAC Nigeria Plc, is much like every other share of UAC Nigeria Plc. also assumed is that there is a substantial, if not unlimited supply of the securities in the market. Furthermore, it is assumed

that there is free entry and exit in the market. This means that anyone including newcomers can freely enter and leave the market.

Perhaps the most important assumption of the hypothesis is the assumption about information flow. It is assumed that information is readily available and known to all. The information is not delayed. It is instantaneously transmitted to the market. It is also not controlled in any systematic manner. Rather, it is widely dispersed and available to the public at virtually no cost. Consequently, every market participant knows everything there is to know about every security.

If the conditions implied in these assumptions are fully met, then market prices should always represent the intrinsic values of securities. But the conditions are hardly fully met in practice. For instance, the hypothesis requires substantial, if not unlimited supply of the securities, but in reality, most of the traded securities are limited by the number of the shares on issue at any point in time. On the free entry and exit assumption, it can be argued that the existence of transaction costs operate to inhibit, trading particularly for deals in small parcels of securities.

Proponents of the hypothesis seem, to accept that even the large stock markets are not perfectly efficient, but argue that what is needed is for the market to be sufficiently efficient. And the market is deemed to be sufficiently efficient if information is available to a sufficient number of participants, and if transaction costs are reasonable, such that they do not deter any investor. Also required is that no group of investors will be seen to consistently achieve superior results in the market. That means that no investor will be seen to outperform a randomly selected portfolio. This sufficiently efficient market concept suggests that there can be levels of market efficiency.

Market efficiency championed in the efficient market hypothesis (EMH) formulated by Eugene Fama in 1970, suggests that at any given time, prices fully reflect all available information on a particular stock and/or market. Fama was awarded the Nobel Memorial Prize in Economic Sciences jointly with Robert Shiller and Lars Peter Hansen in 2013. According to the EMH, no investor has an advantage in predicting a return on a stock price because no one has access to information not already available to everyone else.

When you place money in the stock market, the goal is to generate a return on the capital invested. Many investors try not only to make a profitable return, but also to outperform, or beat, the market.

The Effect of Efficiency: Non-Predictability

The nature of information does not have to be limited to financial news and research alone; indeed, information about political, economic and social events, combined with how investors perceive such information, whether true or rumoured, will be reflected in the stock price. According to the EMH, as prices respond only to information available in the market, and because all market participants are privy to the same information, no one will have the ability to out-profit anyone else.

In efficient markets, prices become not predictable but random, so no investment pattern can be discerned. A planned approach to investment, therefore, cannot be successful.

This "random walk" of prices, commonly spoken about in the EMH school of thought, results in the failure of any investment strategy that aims to beat the market consistently. In fact, the EMH suggests that given the transaction costs involved in portfolio management, it would be more profitable for an investor to put his or her money into an index fund.

Anomalies: The Challenge to Efficiency

In the real world of investment, however, there are obvious arguments against the EMH. There are investors who have beaten the market such as Warren Buffett, whose investment strategy focuses on undervalued stocks, made billions and set an example for numerous followers. There are portfolio managers who have better track records than others, and there are investment houses with more renowned research analysis than others. So how can performance be random when people are clearly profiting from and beating the market?

Counter arguments to the EMH state that consistent patterns are present. For example, the January effect is a pattern that shows higher returns tend to be earned in the first month of the year; and the weekend effect is the tendency for stock returns on Monday to be lower than those of the immediately preceding Friday.

Studies in behavioural finance, which look into the effects of investor psychology on stock prices, also reveal that investors are subject to many biases such as confirmation, loss aversion and overconfidence biases.

      i.   The EMH Response

The EMH does not dismiss the possibility of market anomalies that result in generating superior profits. In fact, market efficiency does not require prices to be equal to fair value all the time. Prices may be over- or undervalued only in random occurrences, so they eventually revert back to their mean values. As such, because the deviations from a stock's fair price are in themselves random, investment strategies that result in beating the market cannot be consistent phenomena.

Furthermore, the hypothesis argues that an investor who outperforms the market does so not out of skill but out of luck. EMH followers say this is due to the laws of probability: at any given time in a market with a large number of investors, some will outperform while others will underperform.

      ii.   How Does a Market Become Efficient?

For a market to become efficient, investors must perceive that the market is inefficient and possible to beat. Ironically, investment strategies intended to take advantage of inefficiencies are actually the fuel that keeps a market efficient.

A market has to be large and liquid. Accessibility and cost information must be widely available and released to investors at more or less the same time. Transaction costs have to be cheaper than an investment strategy's expected profits. Investors must also have enough funds to take advantage of inefficiency until, according to the EMH, it disappears again.

iii.   Degrees of Efficiency

Accepting the EMH in its purest form may be difficult; however, three identified EMH classifications aim to reflect the degree to which it can be applied to markets:

Strong form efficiency - This is the strongest version, which states that all information in a market, whether public or private, is accounted for in a stock price. Not even insider information could give an investor an advantage.

Semi-strong form efficiency - This form of EMH implies that all public information is calculated into a stock's current share price. Neither fundamental nor technical analysis can be used to achieve superior gains.

Weak form efficiency - This type of EMH claims that all past prices of a stock are reflected in today's stock price. Therefore, technical analysis cannot be used to predict and beat a market.

6.07   Comparison between Nigeria Financial Markets and International Markets

A market can be defined simply or rather complexly. In the simplest terms, a market is a system of institutions, rules and procedures relating to the exchange of goods and services between persons or organizations. Markets can be defined in different ways, including by geography, customer, product or even the behavioural characteristics of consumers.

An international market is defined geographically as a market outside the international borders of a company's country of citizenship. A company, to the extent that it is a legally distinct entity from its owners like a corporation, is usually a citizen of the country where it is organized. IBM, for example, was formed in the United States. Thus, any geographic area outside the territorial boundaries of the United States where IBM conducts business is IBM's international market. The conceptual opposite of an international market is the company's domestic market, which is the geographic region within the national boundaries of a company's home country.

ii.   Nigeria financial market

As part of its Focus on Africa series of programs, EMTA presented a seminar in London on November 9, 2006 focusing on Nigeria's financial markets. The seminar, which was sponsored by Standard Bank and held at Simpson's-in-the-Strand for a standing-room only crowd of bankers and investors, featured presentations by representatives of Nigeria's official and regulatory sector, followed by a panel discussion by local and international practitioners.

EMTA vice Chair Dean Menegas of Spinnaker Capital made the initial welcoming remarks followed by Brad Koen, Head of Global Markets for Standard Bank. The introductions highlighted that this is Africa's decade for growth and opportunity.

The official sector presentations began with remarks by Dr. Mansur Muhtar, Director General of the Debt Management Office of Nigeria (delivered by his colleague Yakubu Aliyu), discussing how Nigeria can build a liquid yield curve to meet long term demand for Nigerian government bonds and assist in the pricing of other fixed income assets. This was followed by a presentation by Dr. Sarah Alade, Director of Banking Operations for the Central Bank of Nigeria, who discussed how the country was managing its monetary policy to keep inflation in check in the face of excess liquidity resulting from windfall oil profits. Next, Bode Agusto, Director General of the Office of the Budget of the Nigerian Ministry of Finance, explained how fiscal policy was made, highlighting the fact that the oil price used for budgeting was significantly lower than real oil prices, and projecting the likely effect of elections planned for the spring of 2007 on spending. The final speaker of the first part of the seminar was Mr. Bolaji Shenjobi, President of the Money Market Association of Nigeria, who gave a report on the state of the banking consolidation program that was undertaken in Nigeria just about one year ago.

Each presentation highlighted that Nigeria is in the midst of reforms, which, even with a change of government, or lessening of the ruling party's majority, will very likely continue. Issues of concern to the audience, which were brought out in the Q&A session following the official presentations, focused on how Nigeria could meet demand for more fixed-income assets in the current environment of excess liquidity and improve its infrastructure and legislation to support a growing domestic fixed income market.

Nigeria is currently looking at permitting securities lending and repo transactions to improve liquidity in the domestic market.

The private practitioners panel was moderated by Francis Beddington, Head of Research at Standard Bank, and included Dan Agbor, a local Nigerian lawyer from the law firm Udo Udoma & Belo-Osagie; Vicente Pons, Credit Derivatives trader with Citigroup; Konrad Reuss of Standard & Poor's; Godwin Obaseki of Afrinvest West Africa Ltd.; Jan Dehn of Ashmore Investment Management; Segun Agbaje of Guaranty Trust Bank and John Oshilaja of Standard Bank.

This eclectic and highly distinguished panel covered a number of important and provocative topics including special regulations of importance to foreign investors, a recent interruption of trading in the local market that caused consternation amongst foreign participants, the upcoming elections and the role of political risk in evaluating Nigerian exposure, whether

Nigeria should raise money in the international bond markets to provide investors with a pure credit exposure void of currency risk (despite its current buy-back program of London Club debt) and which countries it could be compared to in the roster of Emerging Markets.

6.08 Role of Government and Local Authorities in Relation to Finance

Central Government control of local authorities is affected in various ways through various governmental or parliamentary agencies. The Minister of Internal Affairs, through the Department of Internal Affairs, attends to the constitutional aspects of all territorial and many special-purpose local authorities, and he also administers legislation of general application, such as that governing local elections and polls, rating, local authority members' contracts, the public's rights of access to meetings, and so on. Further, he plays an important advisory role in the local legislation field, a topic which has already been mentioned. The Controller and Auditor-General are responsible directly to Parliament for the general financial audit of all local authorities. The control of borrowing and roading subsidies is exercised by the Local Authorities Loans Board and National Roads Board respectively, while the Department of Health, the Ministry of Works, and other Departments of State also have important control responsibilities in their different spheres.

Of the various methods of control, that exercised in the financial field as a whole is probably the most influential. It is one of the most vital aspects of the relationship between local authorities and Central Government for, in addition to the close supervision of their financial affairs in general, local authorities are completely subject to Government in respect of the maximum local taxation leviable and State grants and subsidies payable. This is inherent in the New Zealand system of government, under which the Central Government is responsible through Parliament to the people for the overall supervision of all funds diverted from private to public use.

6.09   Review Questions

1. Distinguish between a capital and a money market(5marks)

2. Examine the difference between Nigeria and international financial markets. (5marks)

3. Appraise how a market become efficient. (5marks)

4. Evaluate what an investor stand to gain by patronizing Government Treasury bills. (5marks)

5. A debenture can be redeemable or irredeemable, examine the merits and demerits of each. (5marks)

MODULE 7

7.00 COST OF CAPITAL

7.01 Learning Outcomes

On successful completion of this module, students should be able to:
   i   Discuss the meaning and nature of cost of capital
   ii   Compute the various cost of capital on: equity, preference, debt capital, and Weighted Average Cost of Capital (WACC)
   iii Appraise the use of WACC
   iv   Evaluate the assumptions of WACC

7.02 Cost of Debt

The nominal cost of bond is the rate of interest paid to the bondholder. It is the yield that accrues to the bondholder at the current market price. It is the yield to maturity of the bond. The yield to maturity is the discount rate that equates the present value of the expected periodic interest returns plus the maturity value of the bond to the current market price of the bond.

$$V = \frac{1}{(1+Kd)^1} + \frac{1}{(1+Kd)^2} + - \frac{1+M}{(1+Kd)^n}$$

Where:
   V = the current market value of the bond
   I = annual interest in naira
   M= maturity value of the bond
   Kd = cost of bond

In its simplest form, the cost of bond is calculated as follows:

$$Kd = \frac{1}{V}$$

Thus if a firm borrows ₦100,000 at the rate of 21 percent, the lender will receive and the firm will pay an annual interest of ₦21,000.

$$Kd = \frac{₦21,000}{₦100,000}$$
$$= 21\%$$

The marginal cost of bond is the interest rate which the firm will have to pay for new bonds. It is the yield that will attract new investments in bonds. This yield can be obtained directly from the financial markets. In the case of a firm with outstanding bonds, the marginal cost of bond, that is, bonds issued by the firm, will be the yield to maturity of the existing bonds. This is based on the assumption that the yield on the outstanding issues is likely to be the yield the investors will accept on newly issued bonds of the firm.

After-Tax Cost of Debt

After tax cost of debt is the cost of debt capital after tax has been taken into account. Interest on debt capital is a tax deductible expense, while dividend paid to shareholders is not tax deductible. This means that the higher the interest payment, the lower the tax bill. Tax savings are therefore made whenever interest expenses accrue. This is because government absorbs part of the interest charges. The portion absorbed by government represents gain made by financing with debt capital. The more interest charges arising from increased debt financing, the more the tax savings. Tax implications must, therefore, be considered when deciding on the components of the capital structure. If the firm is financed solely with equity capital, there will be no tax savings.

7.03   Cost of Equity Capital

a. There are two types of equity capital: Internal common equity and external common equity. Therefore, two costs of common equity can be computed, i.e.

K_e = Cost of internal common equity

K_{ne} = External common equity.

i.   Cost of Internal Common Equity (Ke)

This is the minimum rate of return that must be earned on equity-financed investment to keep the value of the existing equity unchanged. Equity capital can be raised either internally by capitalizing reserves or externally by issuing new common stock.

$$Ke \quad = \quad \frac{D_1}{p_0} + g$$

Where

$D_1 = D_0 (1 + g)$ = Dividend in year 1,

D_0 = Dividend received the year before

g = Annual growth of dividends.

$$= \quad \frac{Dividend \cdot in \cdot year \cdot 1}{Mkt \cdot price \cdot of \cdot stock} + \text{annual growth rate of dividend}$$

Illustration 1

Aggwas Ltd has a dividend growth rate of 9%, market price of stock N75, a floating cost of 7% of share price and a dividend per share of N13 was recently received. Determine its cost of equity.

$$Ke \quad = \quad \frac{D_1}{p_0} + g$$

$D_1 \quad = \quad D_0(1+g)$

$\quad = \quad 13(1+0.09)$

$\quad = \quad 13 \times 1.09 \quad = \quad 14.17$

Therefore, $Ke \quad = \quad \dfrac{14.17}{75 - (\frac{7}{100} x75)} + 0.09$

$\quad = \quad 0.2932$

$\quad = \quad 29.32\%$

Notes:

Dividend growth 'g' can be calculated as the product of the firm's retention ratio and the rate of return (ROE) in case of a total equity financial firm. It can also be approximated by the past growth in earnings per share or dividend per share.

i. Taxation and floatation costs are not considered in computing K_e.

ii. Cost of New Common Stock $\mathbf{K_{e(New)}}$

iii. When a company issues a new share capital, it has to offer shares at a price, which is much less than the prevailing market price. Therefore, the cost of retained earnings will be less than the cost of new issues of equity since tax and flotation costs are considered.

Hence,

K_{ne} = D1 + g

NP_0

Where NP_0 = Net proceeds after floatation costs and taxes

Illustration 2

A company's shareholders recently received a dividend of N5 per share and they expect dividends to grow at an annual rate of 15% into the indefinite future. If the market price of the share is N80 and floatation costs are 10% of the share market price, calculate the cost of the new stock.

Solution

$$K_{ne} = \frac{D_1}{NP_0} + g$$

$NP_0 = (80 - 0.1 \times 80) = (80 - 8) = 72$

$D_1 = 5\ (1 + 0.15) = 5.75$

$\therefore K_{ne} = \dfrac{5.75}{72} + 0.15$

$= 0.2298$

$= 22.98\%$

7.04 Weighted Average Cost of Capital (WACC)

WACC is the rate at which a company is expected to pay on an average to all its securities holders to finance its assets. It is the minimum required return that a company must have on an existing asset base, to satisfy its creditors, owners and other providers of capital; otherwise they will invest elsewhere.

Thus the WACC is the composite cost of capital as it represents the aggregate of the cost of various sources of finance applied. This covers the cost of debt, equity, and cost of preference shares. The weighted average costs are then added to give the overall cost of capital, which is known as the WACC. WACC is used as a discount rate in the appraisal of new investment.

Assumptions of WACC

i.   The existing gearing ratio will remain constant

ii.   The project under consideration is the marginal addition to the overall projects of the company.

iii.   The project is of the same average risk as that of the company.

iv.   Project market conditions exist, and market value weights are used to be consistent with the definition of cost of capital.

Illustration 3

Watlas Consult has the capital structure as follows: Debt N3, 600,000, Preference Share N5, 400,000 and Equity capital N21, 000,000. It incurred after-tax costs of 12%, 15% and 21% on the debt, preference shares, and equity capital respectively. You are required to determine the Weighted Average Cost of Capital (WACC)

Capital component	Amount N	% component of the capital structure	After tax (%) Cost of Capital	Total
Debt	3,600,000	12% i.e. 3,600 x 100 30,000	12	12% x 12% = 1.44%
Pref. Share	5,400,000	18% i.e. 3,600 x 100 30,000	15	18% x 15% = 2.7%
Equity Capital	21,000,000	70% i.e. 3,600 x 100 30,000	21	70% x 21% = 14.7%
	30,000,000	100%		18.84%

Thus, WACC = 1.44%+2.7%+14.7% = 18.84%

CAPM

The Capital Asset Pricing Model says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken.

WACC

The Weighted Average Cost of Capital is used to calculate a particular company's cost of capital, the combination of the cost of equity and the cost of debt. A company's assets are financed by either debt or equity, and the WACC is the average of the costs of these sources of financing, each of which is weighted by its respective use in the given situation. By taking a weighted average, we can see how much interest the company has to pay for every dollar it finances.

So, combining the two, you can use CAPM to calculate the cost of equity, and then use that to calculate WACC by adding the cost of debt, usually the tax-effected average interest for all of the company's debt.

7.05   Cost of Redeemable and Irredeemable Debt

Irredeemable debt is debt that has no specific redemption date or maturity period. The issuing authority or entity pays a specified interest rate periodically but provides no data on when the principal will be returned. In many cases, the principal is never paid. The United States Treasury does not issue irredeemable debt. But other national governments and state and local governments do, typically as bonds or debentures, as do companies. Another name for irredeemable debt is perpetual debt or consol.

Callable

As long as a company or other issuing entity does not default on the debt and pays the coupon rate as noted, the coupon payment can theoretically extend forever on irredeemable debt. The issuing entity is responsible for the coupon payments. Therefore, if it defaults, the principal on the bonds will come due. Some such bonds are callable at specific points in time. "Callable" means the issuer has the right to return the investor's principal in the bond and cease all coupon payments. Companies sometimes insert this option to allow themselves an out if the interest rate drops precipitously. This call option enables issuers to significantly reduce interest costs.

Callable Example

To get an idea of how a callable bond works, suppose a company has $50 million in irredeemable bonds outstanding with a coupon rate of 8 percent, slightly more than the prevailing interest rate at the time of issuance. The interest rate steadily drops over a period of time to 5 percent. The company is currently paying $4 million per year in interest payments. A new coupon rate of 5.5 percent would drop the annual payments to $2.75 million per year, a savings of $1.25 million annually. The company calls the bonds at the five-year mark and re-issues similar irredeemable debentures later in the year at the lower coupon rate.

Coupon Rates

Many issuing entities use perpetual bonds as subordinated debt. They often treat their perpetual bonds similar to preferred equity since they do not need to repay the debt. Perpetual bonds typically offer a higher coupon rate than that offered by comparable, redeemable bonds. This higher rate factors in the lack of redemption and captures any embedded call option.

A firm raises capital from different sources to finance a project. Therefore it is necessary to calculate the cost of capital for each source. In order to attract new investors, a firm creates a wide variety of financing instruments or securities, such as debentures, preference shares, equity, etc. Cost of a particular source of capital is referred to as the specific cost of capital.

While we calculate the cost of capital of a firm, we calculate the specific cost of capital of each source of raising funds at first, and then the overall cost of capital is calculated by combining the specific costs into a composite cost. The specific cost of capital also helps to assess the relative cost of pursuing one line of financing over other. In this article we will discuss the methods of measuring the specific cost of various sources of capital.

Debt is the external source of financing. Cost of debt is simply the interest paid by the firm on debt. But interest paid on debt is a tax-deductible expenditure; hence the effective cost of capital is lower than the amount of interest paid. Again, debt may be redeemable or irredeemable. Redeemable debts are those which will be repaid to the suppliers of debt after a specific period, while irredeemable or perpetual debt is not repaid back to the suppliers of debt—only interest on this is paid regularly.

7.06   WACC- Calculation, Application and Interpretation

This seven-part series, authored by Zanders consultants, provides CFOs and corporate treasurers with a better understanding of the weighted average cost of capital (WACC), which is recognized as one of the most critical parameters in strategic decision-making. The series highlights strategies to optimize the capital structure and maximize shareholder value.

This article, the first in the series, describes how to estimate the weighted average cost of capital (WACC) and the issues that need to be considered when doing so.

If companies were entirely financed with equity, there would be little difficulty in determining its cost of capital: it would be the expected return required by shareholders. Most companies, however, are not wholly financed with equity. They tend to issue a variety of financing instruments, including debt, equity and hybrids. Due to this financing mix, companies usually calculate a weighted average cost of capital (WACC).

Overview of WACC Estimation

The WACC is recognized as one of the most critical parameters in strategic decision-making. It is relevant for business valuation, capital budgeting, feasibility studies and corporate finance decisions. When estimating the WACC for a company, there is a clear trade-off between theoretical purity and actual circumstances faced by a company. The decision in this context should reflect the actual environment in which a company operates. In general, the WACC is estimated using the following equation:

$$WACC = R_D * \left[\frac{D}{D+E+H}\right] * [1-\delta] + R_E * \left[\frac{E}{D+E+H}\right] + R_H * \left[\frac{H}{D+E+H}\right]$$

<div style="padding-left:2em">

D: Market value of interest-bearing debt
E: Market value of common equity
H: Market value of hybrid capital
R_D: Cost of interest-bearing debt
R_E: Cost of common equity
R_H: Cost of hybrid capital
Ô: Corporate tax rate

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The estimation of the WACC is based on several key assumptions:

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i   It is market driven. It is the expected rate of return that the market requires to commit capital to an investment.
ii   It is a function of the investment, not the investor.
iii   It is forward looking, based on expected returns.
iv   The base against which the WACC is measured is market value, not book value.
v   It is usually measured in nominal terms, which includes expected inflation.

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vi   It is the link, called a discount rate, which equates expected future returns for the life of the investment with the present value of the investment at a given date.

The WACC seems easier to estimate than it really is. Just as two people will rarely interpret a piece of art the same way, neither will two people calculate the same WACC. Even if two people do reach the same WACC, all the other applied judgments and valuation methods are likely to ensure that each has a different opinion regarding the components that comprise the company value.

Therefore, the following sections of this article will discuss the different WACC components in more detail. Errors that are frequently encountered in practice will be highlighted as well as best market practice as a guide for estimating the WACC.

Capital Structure

The first step in developing an estimate of the WACC is to determine the capital structure for the company or project that is being valued. This provides the market value weights for the WACC formula. Best market practice is to define a target capital structure and this is for several reasons.

First, the current capital structure may not reflect the capital structure that is expected to prevail over the life of the business.

The second reason for using a target capital structure is that it solves the potential problem of circularity involved in estimating the WACC, which arises when calculating the WACC for private companies. For instance, we need to know market value weights to determine the WACC but we cannot know the market value weights without knowing what the market value is in the first place.

To develop a target capital structure, a combination of three approaches is suggested:

1. Estimate the current capital structure: A capital structure can comprise three categories of financing: interest-bearing debt, common equity and hybrid capital. The best approach for estimating the current 'market value-based' capital structure is to identify the values of the capital structure elements directly from their prices in the marketplace, if available. For equity, market prices are available for public companies, but it is more difficult to identify the market value of equity for private companies, business units and also for illiquid stocks.

The same applies to public debt, such as bonds, where the market value can be identified from available market prices. In the case of private debt, however, such as bank loans and private placements, the current value needs to be calculated. (For discussion about the difficulties of calculating the market value of hybrid capital, please refer to the third article in this series on the WACC.) The conclusion is that estimating the current capital structure based on market values could be difficult when market prices are not available. The next approach could assist

in solving this difficulty, by estimating a target capital structure based on information from comparable companies.

2. Review the capital structure of comparable companies: In addition to estimating the market value-based capital structure currently and over time, it is useful to review the capital structures of comparable companies as well.

There are two reasons for this. First, comparing the capital structure of the company with those of similar companies will help to understand if the current estimate of the capital structure is unusual. It is perfectly acceptable that the company's capital structure is different, but it is important to understand the reasons behind this.

The second reason is a more practical one because in some cases it is not possible to estimate the current financing mix for the company. For privately held companies, a market-based estimate of the current value of equity is not available.

3. Review senior management's approach to financing: It is important to discuss the company's capital structure policy with senior management to determine their explicit or implicit target capital structure for the company and its businesses.

This discussion could give an explanation for why a company's capital structure may be different from comparable companies. For instance, is the company by philosophy more aggressive or innovative in the use of debt financing? Or is the current capital structure only a temporary deviation from a more conservative target?

Often companies finance acquisitions with debt they plan to amortize rapidly or refinance with equity in the near future. Alternatively, there could be a difference in the company's cash flow or asset intensity, which results in a target capital structure that is fundamentally different from comparable companies.

Corporate Tax Rate

The WACC is a calculation of the 'after-tax' cost of capital. The tax treatment for the different capital components – such as interest-bearing debt, common equity and hybrid capital – is different. The corporate tax rate in the earlier mentioned WACC equation is applicable to debt financing because in most countries interest expense on debt is a tax-deductible expense to a company.

It is appropriate, however, to take into consideration the fact that several countries apply thin capitalization rules that may limit tax deductibility of interest expenses to a maximum leverage.

Furthermore, in some countries, expenses on hybrid capital could be tax deductible as well. In that case the corporate tax rate should also be applied to hybrid financing and the WACC equation should be changed accordingly. (For more information on hybrid capital please refer to the third article of this series on the WACC.)

Finally, corporate tax can also have a positive impact on the cost of equity. An example is Belgium, which recently introduced a system of notional interest deduction, providing a tax deduction for the cost of equity. This system will be further explained in the fifth article of this series, which elaborates on the impact of notional interest deduction on the WACC. In other words, the calculation of the WACC for Belgian financing structures needs to be revised.

The main conclusion is that the application of the corporate tax rate in the WACC equation will differ per country. As mentioned before, when estimating the WACC for a company, there is a clear trade-off between theoretical purity and actual circumstances faced by the company. Best market practice is to reflect the actual environment in which a company operates. Therefore the WACC equation needs to be revised accordingly.

Cost of Interest-bearing Debt

The cost of interest-bearing debt can be estimated using the following equation:

$R_D = R_F + DRP$

R_D: Cost of interest-bearing debt
R_F: Risk-free rate
DRP: Debt risk premium

The category of interest-bearing debt consists of short-term debt, long-term debt and leases. Many companies have floating-rate debt, as an original issue or artificially created by interest rate derivatives. If floating-rate debt has no cap or floor, then it is best market practice to use the long-term debt interest rate. This is because the short-term rate will be rolled over and the geometric average of the expected short-term rates is equal to the long-term rate.

The cost of debt is calculated using the marginal cost of debt, i.e. the cost the company would incur for additional borrowing or refinancing its existing interest-bearing debt. This cost is a combination of the risk-free rate and a debt risk premium. Credit ratings are the primary determinants of the debt risk premium. (More information on the relationship between the WACC, shareholder value and credit ratings can be read in the second article of this series on the WACC.)

The risk-free rate is the theoretical rate of return attributed to an investment with zero risk. The risk-free rate represents the interest that an investor would expect from an absolutely risk-free investment over a specified period of time. In theory, the risk-free rate is the minimum return an investor should expect for any investment.

In practice, however, the risk-free rate does not technically exist, since even the safest investments carry a very small amount of risk. Therefore best market practice for WACC estimations is to use the yield on a 10-year government bond as a proxy for the risk-free rate.

Estimating the WACC can be a challenging exercise, however, because a risk-free government bond is not always available in emerging markets. (This will be discussed further in article seven of this series.)

The cost of debt is the yield-to-maturity on publicly traded bonds of the company. Failing availability of that, the rates of interest charged by banks on recent loans to the company would also serve as a good cost of debt. When using yield-to-maturity to estimate the cost of debt it is important to make a distinction between investment and non-investment grade debt. Investment grade debt has a credit rating greater than or equal to BBB- (Standard & Poor's). For investment grade debt, the risk of bankruptcy is relatively low.

Therefore, yield-to-maturity is usually a reasonable estimate of the opportunity cost. The coupon rate, which is the historical cost of debt, is irrelevant for determining the current cost of debt. Best market practice is to use the most current market rate on debt of equivalent risk. A reasonable proxy for the risk of debt is a credit rating.

When dealing with debt that is less than investment grade, pay attention to the difference between the expected yield-to-maturity and the promised yield-to-maturity. The latter assumes that all payments (coupon and principal) will be made as promised by the issuer. Therefore it is necessary to compute the expected yield-to-maturity, not the quoted, promised yield. This can be done based on the current market price of a low-grade bond and estimates of its expected default rate and value in default.

If the necessary data is not available, use the yield-to-maturity of BBB-rated debt, which reduces most of the effects of the differences between promised and expected yields. Leases, both capital and operating, are substitutes for other types of debt. In many cases it is reasonable to assume that their opportunity cost is the same as for the company's other long-term debt. Since capital leases are already shown as debt on the balance sheet, their market value can be estimated just like other debt.

Operating leases should also be treated like other forms of debt. As a practical matter, if operating leases are not significant, it could be decided not to treat them as debt. They can be left out of the capital structure and the lease payments could be treated as an operating cost.

Cost of Common Equity

For estimating the opportunity cost of common equity, best market practice is to use the expanded version of the capital asset pricing model (CAPM). The equation for the cost of equity is as follows:

RE = RF + [βL * MRP] + SRP

RE: Cost of common equity
RF: Risk-free rate
βL: Levered beta of equity

MRP: Market risk premium
SRP: Specific risk premium

The market risk premium is the extra return that the stock market provides over the risk-free rate to compensate for market risk. The estimate of the historically derived market risk premium is about 5 per cent. This estimate depends on how much history is used. Structural changes in the economy and markets, however, suggest that more recent data provides a better basis for predicting the future. Therefore, best market practice is to use data from the second half of the last century. This is a sufficiently long period to achieve statistical reliability, while avoiding the potentially less relevant market returns.

The historically derived market risk premium can be benchmarked against the implied market risk premium of today's market capitalization and earnings. This can be done under different assumptions for future earnings growth and reinvestment. Recent studies show an implied market risk premium of 5-5.5 percent, which is comparable to the historical derived estimate.

Beta is the measurement for the systematic risk of a company and is typically the regression coefficient between historical dividend-adjusted stock returns and market returns. For decades, investors were only concerned with one factor, beta, in their portfolio selection. Beta was considered to explain most of a portfolio's return.

This one-factor model, otherwise known as standard CAPM, implies that there is a linear relationship between a company's expected return and its corresponding beta. Beta is not the only determinant of stock returns though so CAPM has been expanded to include two other key risk factors that together better explain stock performance: market capitalization and book-to-market (BtM) value.

Recent empirical studies indicate that three risk factors – market (beta), size (market capitalization) and price (BtM value) – explain 96 percent of historical equity performance.

These three-factor models go further than CAPM to include the fact that two particular types of stocks outperform markets on a regular basis: small caps and value stocks (high BtM value).

The approach to estimate beta depends on whether the company's equity is traded or not. Therefore, the beta of a company can be estimated in two ways. The first and preferred solution for public companies is to use direct estimation, based on historical returns for the company in question.

The second way is to use indirect estimation. This solution is mainly applicable to business units and private companies, but also for illiquid stocks or public companies with very little useful historical data. This estimation is based on betas from comparable companies, which are used to construct an industry beta. When constructing the industry beta, it is important to 'unlever' the company betas and then apply the leverage of the specific company.

Best market practice is to incorporate a specific risk premium for small caps and value stocks when estimating the cost of equity. As mentioned earlier, this premium may be applicable to a specific company, based on its market capitalization and BtM value.

Cost of Hybrid Capital

Hybrids are financial instruments that combine certain elements of debt and equity, such as preferred equity, convertible bonds and subordinated debt. WACC estimations are complicated by the introduction of hybrid capital into the capital structure.

This is most easily resolved through an effective split of the instrument's value into debt and equity to reflect the true debt-equity mix. (The fifth article of this series describes how issuing hybrids can optimize the WACC. The article outlines how hybrids are analysed on their impact on shareholder value, but they are also analysed from the perspective of treatment by accountants/IFRS and rating agencies.)

7.07   Review Questions

1.   The cost of capital is nothing more than the rate of return which the company pays suppliers of capital. Do you agree?. Discuss. (10marks)

2.   Appraise the uses of cost of capital. (5marks)

3.   Determine the effect on the cost of capital of a firm:
   a.   If the going rate of interest falls.(5marks)
   b.   If the flotation costs of new issues are substantially increased.(5marks)

4.   Ziks Plc floated new common stock in the capital market. It paid a dividend of ₦3.20 last year. Because of the earnings performance in recent years, it is projected that the stock price will grow at the rate of 6 percent p.a. The stock currently sells at ₦37 per

share. The flotation cost of new shares is 10 percent of selling price. Calculate the cost of (a) the existing equity, and (b) newly issued equity.(10marks)

5.   Standard Cotton Mill Ltd. finances its operations with a combination of debt and equity. The market value of its equity shares is N1,200,000, while the rate of dividend expected by equity holders is 12 percent. The market value of its loan capital is N800,000. It pays 8 percent on them. Tax rate is 55 percent. Compute the company's overall cost of capital.(10marks)

MODULE 8

8.00   DIVIDEND POLICY

8.01   **Learning Outcomes**

On successful completion of this module, students should be able to:
  i   Analyse the meaning of a Company's Dividend Policy

  ii   Describe factors affecting dividends decision/policy
  iii Examine the contributions of M-M in 1959 and M.J Gordon in 1959
  iv   Itemize practical factors that influence a company's dividend policy like growth parts statutory requirement, share valuation etc
  v   Evaluate the theories of the relevant and irrelevant school of thought.

8.02   **Factors Affecting Dividend Decision/Policy**

In the opinion of Akinsulire (2011), it is important for a company to set a standard policy with respect to the payment of cash dividends. The factors involved in formulating dividend policy include Legal Provisions, Contractual Constraints, Liquidity Constraints, Company growth prospects, Owner's considerations, Capital market considerations, Tax considerations, Government Regulation, Statutory requirements, Share valuation, Risk Factor, Loan Redemption, Level of Inflation, Dividend Policy of similar companies, and the Liquidity preference of the Dominant Shareholders. Each of these is briefly discussed hereunder.

  a.   **Legal provisions:** By the provisions of Sections 379-382 of the CAMA 1990 (as amended), a company may pay dividends from profits arising from the use of the company's property through it is a wasting asset , Revenue reserves, and from realized profit on a fixed asset sold (but where more than one asset is sold, the net realized profit on the assets sold, calculated on conventional accounting principles). It is forbidden to distribute dividend out of capital.
  b.   **Contractual constraints:** Certain protective covenants in indenture agreements for long-term debts, term loans, preferred stock agreement and lease contracts often restrict the abilities of companies to pay cash dividends. These constraints are meant to protect creditors, preference shareholders and lessors from losses due to the insolvency of the company.
  c.   **Liquidity constraints:** Dividends represent cash outflows. The mere fact that a company is profitable or has a huge amount of retained earnings shown in the statement of financial position (balance sheet) does not mean that cash is available for the payment of dividends. It should be noted that retained earnings are usually invested in operating assets. Therefore, a company's ability to pay cash dividends is generally constrained by the excess cash available, i.e. its liquidity position
  d.   **Company growth prospects:** The more rapid the rate at which a company is growing, the greater its needs for internal funds. Such a company, therefore, is more likely to retain profits than to pay a cash dividend. In this wise, the growth of the company must be considered in formulating dividend policy.
  e.   **Owner's considerations:** In formulating a dividend policy, the primary concern should be how to maximize the company's owners' wealth in the long run. If a company has a

high dividend payout ratio, it may have to finance its new investments from issuing new ordinary shares. If the existing ordinary shareholders are not able to subscribe to the new issues, outsiders will come in, and this will dilute the ownership structure and the existing shareholders will lose control of the company. To avoid this, shareholders may prefer a lower cash dividend payment so that the investment can be financed with retained earnings.

f. **Capital market considerations:** Transaction and floatation costs which cover the costs of underwriting in the capital market are very high and expensive. It is only well established companies with a high record of profitability and stability of earnings that have access to capital markets. Small firms should make use of retained earnings to finance their operations.

g. **Tax considerations:** Given the behavior of human beings, when the majority of shareholders are in the high-income bracket, they prefer to receive returns in the form of capital profits such as bonus shares. This is so because cash dividend attracts high personal income tax. However, if shareholders are in the low-income bracket, they prefer cash dividend since they will pay less personal income tax.

h. **Government regulation:** Government sometimes issues guidelines to restrict the amount of dividend payable to shareholders by companies. These guidelines restrict the payment of dividends to a percentage of after-tax profits. This position changed as from 1988 when dividend payment was deregulated.

i. **Statutory requirements:** Some companies are required by law to transfer a certain percentage of their profit before/after tax to statutory reserves. For example, insurance companies and banks.

j. **Share valuation:** Investors prefer companies whose dividend payout is relatively stable over time. Gentle upward movement is more desirable than violent fluctuations in either direction. These factors often guide companies to adopt a very cautious dividend policy.

k. **Risk factor:** If a company wishing to obtain funds by public issue is not a blue-chip company; it may have to offer high dividend rates in order to entice investors to undertake the risk involved. This is not good and should be avoided.

l. **Loan redemption:** If loans or preference share capital is due for redemption within a short period, funds will be needed to effect the redemption and this might cause a reduction in the level of dividend payout.

m. **Level of inflation:** Investors expect dividends to increase in line with the level of inflation. Also, in a world of rising inflation rate, as is the case in Nigeria today, current flow is better than future income when the purchasing power of income will be low.

n. **Dividend policy of similar companies:** Financial managers of companies often study the dividend policies of companies in the same industry and tend to follow a similar policy.

o. **Liquidity preference of the dominant shareholders:** Most companies quoted on the Nigerian Stock Exchange have significant foreign equity participation. If these foreign shareholders prefer bonus – capital games in view of the fact that the exchange rate of the naira is not favourable to the repatriation of dividend, the company's dividend policy will be in favour of these foreign shareholders to the detriment of Nigerian shareholders.

Schools of Thought on Dividend Policy

There are two popular schools of thought on dividend policy. They are the Relevancy School of Thought and the Irrelevancy School of Thought

8.03   Relevancy School of Thought

-The proponents of this School of Thought, particularly Professor James E. Walter and M. J. Gordon (1959) argued that dividends were all that mattered in the determination of share prices. This argument is based on the fundamental theory of share values. Its assumptions are:

1. The market value of a company's shares depends on:
    a. The size of dividends paid
    b. The growth rate in dividends, and
    c. The shareholders' required rate of return
2. The growth rate in dividends depends on how money is reinvested in the company, and so on the rate of earnings retention.
3. Shareholders will want their company to pursue a retention policy that maximizes the value of their shares.

Myron Gordon in his article titled "Dividends, Earnings and Stock prices" provided some empirical data to support the dividend supremacy hypothesis and the effect of dividend payout ratios on price-earnings ratios. According to him, this was conclusive evidence that equity stock value is derived from dividends.

The dividend supremacy argument has a good deal of practical appeal. Essentially, an investor who plans to hold his shares in perpetuity as most of us do expects nothing other than dividends. Such an investor would be naïve to ignore payout possibilities in his assessment.

The following are the assumptions Professor J.E. Walter's version of Dividend Relevancy School of Thought:

1. The firm finances all investments through retained earnings
2. The firm maintains IRR and WACC
3. All earnings are either distributed as dividends or reinvested internally immediately.
4. The firm has a very long or infinite life
5. The corporate tax does not exist.

Arguments for the Relevancy School of thought otherwise known as the Dividend Supremacy Theory are as follows:

a. **Information value argument:** Dividend policy has image-making potentials. A firm's dividend policy creates a favourable or unfavourable image for the firm. This is more so if there is a change in the dividend policy. This may affect the market of a company's shares irrespective of whether there is no change in earnings.

b. Certainty argument: It is argued that cash dividends reduce the uncertainty of capital gains. This, therefore, implies that many shareholders will prefer companies that pay regular cash dividends, and will, therefore, value their shares more highly.

c. Clientele argument: The clientele hypothesis states that the dividend policy of a firm attracts an identifiable class of investors to it. Thus, investors' agents could pick shares because of the consistency of their payment rate.

d. Taxation argument: The rate of tax is in most cases different on income from dividends and capital gains. This disparity in the personal income tax system can have an impact on investors' preferences for either cash dividends or retained earnings. If the shareholder's marginal rate of tax is high than the rate of capital gains tax, he will likely prefer retained earnings to a cash dividend.

e. Capital rationing argument: When a company is faced capital rationing problem because of insufficiency of funds to undertake all the available viable capital expenditure projects, the payment of dividends by reducing retained earnings will inevitably deplete the funds available. Therefore, Casberg in his "Analysis for Investment Decision" puts if forward that dividend should be reduced in order, at least, to maximize the supply of capital.

f. "Bird-in-hand" argument: There is the saying that 'a bird in hand is worth more than two in the bush'. This arises from the existence of uncertainty in the capital market economy. If there is certainty and there are no transaction costs, dividends can be capitalized into the share price as the company.

With uncertainty, a series of other issues arise. The required rate of return, (ke) rises as the dividend payout is reduced. Risk-averse investors are not indifferent to the division of earnings into dividends and capital games in the share prices. Therefore, to offset a 1% reduction in dividends requires a more than 1% increase (This is known as the Gordon Model).

With the volatile capital market nature in Nigeria, the maintenance of the increase in share price is not guaranteed. Shareholders may prefer to have the cash and invest it or spend it, most especially with the presence of agency costs. It should be noted that in real-world situations, there is the general belief that dividends are relevant and each company must develop a dividend policy, which fulfills the goals of its owners and maximizes their wealth in the long run.

8.04   Irrelevancy School of Thought of Dividend Policy

Franco Modigliani and Merton Miller (1961) popularly referred to as M&M are the famous advocates of the irrelevancy of dividends. According to Miller and Modigliani (MM), under a perfect market situation, the dividend policy of a company is irrelevant, as it does not offset the value of the company. They argue further that the value of the company depends on the company's earnings which result from its investment policy.

A company operating in perfect capital market conditions may face the following three situations regarding the payment of dividends:

i   The company has sufficient cash to pay dividends
ii The company does not have sufficient cash to pay dividends and therefore, it issues new shares to finance the payment of dividends.
iii The company does not pay dividends, but a shareholder needs cash.

When the company pays dividends, shareholders get cash, but the company's assets (cash and bank balances) reduce. What shareholders gain in the form of cash dividends, they lose in the form of their claims on the assets. Thus, there is a transfer of wealth from one shareholder's pocket to another. The value of the company under this capital perfect market condition will remain unaffected.

When the company issues new shares to pay dividends, existing shareholders get cash in form of cash dividends, but suffer an equal amount of capital loss since the value of their claim on assets reduces. The new shareholders part with their cash to the company in exchange for new shares at a fair price per share.If the company does not pay any dividend, a shareholder can create a "home-made dividend" by selling a part of his/her shares at the market (fair) price in the capital market for cash. This reduces the existing shareholders' number of shares and increases the new shareholder's shares.

M-M theory is anchored on the following assumptions:

i   Perfect capital markets, where investors act rationally and have access to perfect and costless information.
ii No floatation costs on securities issued by a company and no transaction costs on securities sold by a shareholder.
iii A world of no taxation, or if there is taxation, the same tax rate is applicable to capital gains and dividend income.
iv Perfect certainty by every investor as to future investments and profits of the company. (This assumption was later dropped by M-M).
v   Risks of uncertainty do not exist.
vi The company will maintain a fixed investment policy.

The following points strengthen the M-M argument:

1. If the entire company's profits are distributed as dividends, each existing shareholder would gain but would suffer a proportionate loss in the form of a reduction in the relative share of the company. Absence of retained earnings implies that new shares or loan stocks will be issued to raise funds to finance internal investment programs. Shareholders should, therefore, be indifferent between payment of dividend and retained earnings.

2. A shareholder's consumption preference need not suffer by the dividend policy adopted by his company. Theoretically, if a company pays out more cash dividends than an investor needs, it is assumed that such investor will apply the excess cash to

buy more shares of the company. In a real life situation, this is not true particularly in Nigeria today. If fairer dividends are paid, it is assumed that the shareholder will dispose off a proportionate portion of his shares to attain his consumption level. For this reason, shareholders should be indifferent to a payment of dividend and retained earnings.

3. M-M argued that if a company with investment opportunities decides to pay a dividend so that retained earnings are insufficient to finance all the investments, earning additional funds from outside sources would make up the shortfall in funds. The loss of value in existing shares as a result of obtaining outside finance instead of using retained earnings is exactly equal to the amount of the dividend paid.

M-M also argued that if the company raised new funds not in the form of shares but as an issue of loan stock, the irrelevancy of dividend policy remains unaffected.

In spite of the fact that the higher the dividend paid, the lower the retention, the two serve the same purpose of maximizing the shareholders' wealth. Whereas retained earnings are used to finance expansion, dividend payment increases the purchasing power of the shareholders.

The utilization of retained earnings has the following advantage:
→ The dividend policy of a company is in practice determined by the Board of Directors. From point of view, retained earnings are an attractive source of finance as projects can be undertaken without the involvement of shareholders or any outsiders.

Thus, management of most companies believes that there is no cost associated with the use of retained earnings as it does not involve any cash-flow. Also, his use of retained earnings as opposed to the issuance of new shares or debentures avoids floatation costs. Finally, control is not diluted as new shares are not issued.

However, a critical factor is the financial and taxation position of the company's shareholders. Because of taxation considerations, they would rather make a capital project than receive the cash dividend. The finance by retained earnings would be preferred to other methods.

It should be expected that the conflicting schools of thought about the relevance of dividend policy to shareholder wealth could be resolved by empirical evidence, i.e. by looking at the facts in the 'true world'. Unfortunately, although empirical research has been carried out, it has so far proved inconclusive, and neither point of view can yet be said to have 'won'. Intuition and the actual practice of companies may suggest their dividend policy is relevant, however, this view cannot be firmly proved.

In practice, it would appear that investors are not indifferent to the extent to which earnings are paid out as dividends. Empirical evidence suggests that dividends are more important than earnings in determining the market values of shares. The main reasons for this assertion are:

i   The payment of dividends provides evidence that the company is able to generate cash from its operations as it is shown in the cash flow statement of the company. Therefore, a stable dividend policy should lead to higher share prices. This is because of the greater confidence investors have about the future prospects.

ii   Changes in dividend policies are generally considered to be reliable indications of changes in future expectations of earnings.

iii   Uncertainty tends to give the impression that investors value cash dividends more highly than dividends payable in the future.

Management of profit-making organizations must attempt to balance the various factors when determining their dividend and retention policy as:

i   Investors will react favourably to a consistent and stable level of distribution, preferably with a steady growth. A steady dividend growth will, all other things being equal, lead to a higher share price which is of course, in the best interests of the existing shareholders.

ii   Management must retain sufficient profits for re-investment to help ensure that the company's gearing remains within the desired limits.

iii   A company's dividend policy may be restricted by the availability of liquid funds.

iv   The total dividends that can be paid out to shareholders – ordinary and preference (whether in cash or by issuing new shares) may be restricted relevant provisions of the law.

8.05   Review Questions

1.   Discuss dividend policy. (5marks)
2.   What is the Modigliani- Miller dividend irrelevancy theory? (5marks)
3.   Discuss the various factors affecting dividend policy of companies(5marks)
4.   Discuss the relationship between the internal financing of a company and its dividend decision. (5marks)
5.   Colico Burnt Bricks Ltd posted a profit before tax in 2008 to the tune of   ₦9.3 million. Company Income Tax was ₦2.8million.
     The company's capital structure is as follows:
     Ordinary shares (10,000,000 shares of ₦1)   N10, 000,000
     8% preference shares   2,000,000
                                                                              12,000,000
     You are required to calculate the EPS for 2008(10marks)

6.   John Bull Resources Plc pays a dividend of N4.80 per share. Its share currently sells at N145 per share.
     a.   What is the annual dividend yield?
     b.   If the company has a payout ratio of 50%, what is the P/E ratio? (10marks)

7.   Inno-Chris Industries Plc pays a quarterly dividend. On the day before the stock went ex-dividend, the stock sold at N95. The annual dividend yield is 6%. Based solely on the impact of a cash dividend, by how much should the stock go down on the ex-dividend date? What will the new price of the stock be? (10marks)

8. East Chad Interbiz Plc has just announced a quarterly dividend of N2.50 per share.
   a.   When will the stock price fall to reflect the dividend payment? Is it on the record date, the ex-dividend date or the payment date?
   b.   Ignoring taxes, by how much is the stock price likely to fall?
   c.   Suppose that all investors pay tax at 40 percent on dividend and nothing on capital gains. What is the likely fall in the stock price? (10marks)
9. Ariwa-Ohaneze Holdings Plc is financed solely with equity. Its cost of capital is 12 percent. It treats its cost of capital as the opportunity cost of retained earnings. Because of flotation costs and underpricing, the cost of common stock financing is 13 percent. The company expects to generate an after-tax earnings of N3.5 million in the coming year. It treats dividends as a residual decision.
   a.   How much dividend out of the N3.5 million earnings should be paid if the company has N2.8 million in viable projects whose expected return exceeds 12% ?
   b.   How much in dividend should be paid if it has N3.5 million in projects whose expected return exceeds 12% ?
   c.   How much dividend should be paid if it has N5.7 million in projects whose expected return exceeds 13%? What else should be done?(15marks)

10.   The stock of Paul Joe Industries. Plc currently sells at N100 per share. Next year's earnings and dividends are expected to be N8 and N4 respectively. Earnings and dividends are expected to grow at the rate of 10 percent yearly perpetually. Investors expect 12 percent on this class of investment. Assuming that the company announces a decision to switch over to a 100 percent payout ratio and in consequence, will henceforth issue new shares to finance growth. Use the perpetual growth model:

Po   = D_1 to show that the current stock is unchanged.
            Ke – g(10marks)

11.   Uche-Best Breweries Plc has done well in the stock exchange in recent years. Consequently, its stock has risen from N36 per share to N88 per share. Its current statement of net worth is:

Common stock (3 million shares	N
Issued at par value of N20 per share)	60,000,000
Share premium	30,000,000
Retained earnings	90,000,000
	N180,000,000

   a. What change should occur in the statement of net worth after a 2 to 1 stock split?
   b. What will the statement of net worth look like after a 3 to stock split?
   c. Assume Uche-Best Breweries plc earned N12,000,00. What would its earnings per share be before and after the 2 to stock split?
   d. What would the price per share be before and after the 2 to 1 and 1 stock splits? (Assume the price-earnings multiple of 25 remain the same)
   e. Should the stock split change the price multiple of the company? (10marks)

12. Stock repurchase programmes tend to increase the company's share price because they reduce the amount of shares on issue thereby increasing earnings per share. Is this a valid reason for stock repurchase? (10marks)

MODULE 9

9.00   FINANCIAL ANALYSIS IN BUSINESS VALUATIONS

9.01   Learning Outcomes
On successful completion of this module, students should be able to:
- i   Appraise the basic issues in financial statement analysis
- ii   Evaluate fund flow statement analysis
- iii Assess why a business may need to be valued
- iv   Examine the various methods of valuing a business that is about to be acquired
- v   Apply mathematical formula where applicable to value the worth of an investment
- vi   Deconstruct the drawback of each method
- vii Handle valuation problems efficiently.

9.02   Basic Financial Analyses

Financial ratios are a convenient way to summarize large quantities of financial data and to compare firms' performance. They enable investors to take a unique look at the inner workings of companies – but do not substitute for a crystal ball. They won't tell you all of the company's inSnermost secrets nor will they answer all of your questions. They will, however, give you a firm foundation to build your analysis and subsequent investment decisions.

Before getting started, it is imperative to distinguish between the three most important financial statements:

i Income Statement – a financial statement that shows the revenues, expenses and net income of a firm over a period of time *Balance Sheet – a financial statement that shows the value of the firm's assets and liabilities at a particular time *Statement of Cash Flows – a financial statement that tracks cash coming into and flowing out of a firm over a period of time

> When it comes to various financial ratios, they can be categorized into four broad groups:

ii. Leverage Ratios – show how heavily a firm is in debt and measures its ability to meet financial obligations *Liquidity Ratios – measure how easily a firm can convert its assets into cash *Efficiency Ratios – measure how productively the firm is using its assets *Profitability Ratios – measure a firm's return on its investments, giving an overall indication of its performance

Now let's take a look at some of these ratios.

Leverage Ratios *Long-Term Debt Ratio = long-term debt / long-term debt + equity *Debt-Equity Ratio = long-term debt / equity *Total Debt Ratio = total liabilities / total assets

iii. Times Interest Earned = EBIT / interest payments *Cash Coverage Ratio = EBIT + depreciation / interest payments *Fixed-charge Coverage Ratio = EBIT + depreciation / interest payments + (debt repayment)/ (1 – tax rate)

Liquidity Ratios *Net Working Capital to assets = net working capital / total assets *Current Ratio = current assets / current liabilities *Quick Ratio = cash + marketable securities + receivables/current liabilities *Interval Measure = cash + marketable securities + receivables/average daily expenditures from operations *Cash Ratio = cash + marketable securities/current liabilities

Efficiency Ratios *Total Asset Turnover = sales / total assets *Average Collection Period = receivables/average daily sales *Inventory Turnover = cost of goods sold / inventory *Days' Sales in inventories = inventory / cost of goods sold/365 *Average Payment Period = payables/average daily expenses

Profitability Ratios *Net Profit Margin = net income / sales *Return on Assets = net income / assets *Operating Profit Margin = net income + interest / sales *Operating Return on Assets = net income + interest / total assets *Return on Invested Capital = net income + interest / debt + preferred equity + common equity *Return on Equity = net income / equity *Payout Ratio = dividends / earnings *Plowback Ratio = 1 – payout ratio *Growth in Equity from Plowback = plowback ratio x ROE

Using Financial Ratios Once you have selected and calculated important ratios, you still need some way of judging whether they are high or low. In essence, you need a benchmark for assessing a company's financial position. A good starting point is to compare them to the equivalent figures for the same company in earlier years. This will show you whether the company has improved or deteriorated in certain fundamental areas. It is also helpful to compare ratios with the ratios of competing companies in the same specific-business area as well as overall industry averages. (On a side note, don't be alarmed if you notice certain industries having very contrasting ratios with other industries. For example, the retail industry typically has a higher asset turnover and a lower operating profit margin than the steel industry. This is simply due to the nature of operating a business in this industry.)

Word of Caution Financial ratios will rarely be useful if practiced mechanically. It requires a large dose of good judgment. Financial ratios seldom provide answers but they do help you ask the right questions. It is important to note that accounting data does not necessarily reflect market values properly, and so must be used with caution. In addition, accounting rules are subject to change, like everything else in life. This means that your concrete analysis may not be a fair representation of the financial position of a company after changes have been put in place, which could prove costly if you invested.

Now that you understand a bit more about what the numbers represent and where they come from, you may be wondering what they all mean. Financial ratios are one technique that you can use to analyze the data found on the balance sheet and income statement. Financial ratios are classified into four categories: liquidity ratios, activity ratios, profitability ratios and long-term debt-paying ability (or coverage) ratios.

9.03   Ratio Analysis

A ratio analysis is a quantitative analysis of information contained in a company's financial statements. Ratio analysis is based on line items in financial statements like the balance sheet, income statement and cash flow statement; the ratios of one item – or a combination of items - to another item or combination are then calculated. Ratio analysis is used to evaluate various aspects of a company's operating and financial performance such as its efficiency, liquidity, profitability, and solvency. The trend of these ratios over time is studied to check whether they are improving or deteriorating. Ratios are also compared across different companies in the same sector to see how they stack up, and to get an idea of comparative valuations. Ratio analysis is a cornerstone of fundamental analysis.

BREAKING DOWN 'Ratio Analysis'

While there are numerous financial ratios, most investors are familiar with a few key ratios, particularly the ones that are relatively easy to calculate. Some of these ratios include the current ratio, return on equity, the debt-equity ratio, the dividend payout ratio and the price/earnings (P/E) ratio.

For a specific ratio, most companies have values that fall within a certain range. A company whose ratio falls outside the range may be regarded as grossly undervalued or overvalued, depending on the ratio.

For example, if the average P/E ratio of all companies in the S&P 500 index is 20, with the majority of companies having a P/E between 15 and 25, a stock with a single-digit P/E would be considered undervalued, while one with a P/E of 50 would be considered overvalued. Of course, this ratio would typically only be considered as a starting point, with further analysis required to identify if these stocks are really as undervalued or overvalued as the P/E ratios suggest.

As well, ratios are usually only comparable across companies in the same sector, since an acceptable ratio in one industry may be regarded as too high in another. For example, companies in sectors such as utilities typically have a high debt-equity ratio, but a similar ratio for a technology company may be regarded as unsustainably high.

Ratio analysis can provide an early warning of a potential improvement or deterioration in a company's financial situation or performance. Analysts engage in extensive number-crunching of the financial data in a company's quarterly financial reports for any such hints.

Successful companies generally have solid ratios in all areas, and any hints of weakness in one area may spark a significant sell-off in the stock. Certain ratios are closely scrutinized because of their relevance to a certain sector, as for instance inventory turnover for the retail sector and days sales outstanding (DSOs) for technology companies.

9.04   Funds –Flow Statement Analysis

Fund flow is the net of all cash inflows and outflows in and out of various financial assets. Fund flow is usually measured on a monthly or quarterly basis; the performance of an asset or fund is not taken into account, only share redemptions, or outflows, and share purchases, or inflows. Net inflows create excess cash for managers to invest, which theoretically creates demand for securities such as stocks and bonds.

BREAKING DOWN 'Fund Flow'
Investors and market analysts watch fund flows to gauge investor sentiment within specific asset classes, sectors or the market as a whole. For instance, if net fund flows for bond funds during a given month are negative by a large amount, this signals broad-based pessimism over the fixed-income markets.

A fund flow focuses on the movement of cash only, reflecting the net movement after examining inflows and outflows of monetary funds. These movements can include payments to investors or payments made to the company in exchange for goods and services.

The fund flow does not include any funds due to be paid but has not yet been paid. This includes arrangements where a debtor is scheduled to pay a certain amount per a completed contract, but the payment has not been received and the obligations on the part of the company have not been settled.

Fund Flow Statements

A fund flow statement is a disclosure of the types of inflows and outflows the company has experienced. It is a forum in which to provide information regarding any fund flow activity that might be out of the ordinary, such as a higher-than-expected outflow due to an irregular expense. Further, it often categorizes the various transaction types and sources to help track any activity changes.

Fund Flow Changes

If the fund flow changes, it often reflects a change in customer sentiment. This can be related to new product releases or improvements, recent news regarding the company or shifts in feelings on the industry as a whole. Positive fund flow changes note an upswing in inflow, a lessening of outflow or a combination of the two. In contrast, negative fund flow suggests lower inflows, higher outflows or both.

While occasional shifts may not be indicative of issues within the company, prolonged negative fund flows can be a sign there are some issues present, as this is a reflection of income not being sufficient to meet the company's expenses. If this trend continues, it could mean the company needs to acquire a form of debt to continue operations.

9.05   Methods of Valuing a Business

Business valuation is a process and a set of procedures used to estimate the economic value of an owner's interest in a business. Valuation is used by financial market participants to determine the price they are willing to pay or receive to affect a sale of a business. In addition to estimating the selling price of a business, the same valuation tools are often used by business appraisers to resolve disputes related to estate and gift taxation, divorce litigation, allocate business purchase price among business assets, establish a formula for estimating the value of partners' ownership interest for buy-sell agreements, and many other business and legal purposes such as in shareholders deadlock, divorce litigation and estate contest.[1] In some cases, the court would appoint a forensic accountant as the joint expert doing the business valuation.

9.06   Asset Basis for Valuing a Business

An asset base refers to the underlying assets giving value to a company, investment or loan. The asset base is not fixed; it will appreciate or depreciate according to market forces. Lenders use physical assets as a guarantee that at least a portion of money lent can be recouped through the sale of the backed asset in the case that the loan itself cannot be repaid.

BREAKING DOWN 'Asset Base'

The value of a home might increase or decrease over time, affecting the underlying collateral in a mortgage. Similarly, the price of a commodity used as the asset base of derivative can also increase or decrease rapidly, changing the price that investors are willing to pay for it. Examples of asset bases include a home (for a mortgage) and factory equipment (business loan). A derivative would "derive" its value from an underlying asset.

9.07   Earnings Basis for Valuing a Business

Earning basis method of valuation is the most popularly used method when it involved a large number of shareholding. This could occur when two companies plan a merger or an investor plans to buy a large amount of shares in an entity.

An earnings basis is classified into two methods:

    i   Accounting rate of return (ARR)

    ii   Price earnings ratio (P/E ratio)

These two approaches are the same because P/E ratio is the reciprocal of the earning yield which is itself a measure of the return on capital employed.

ARR Approach- An investor predetermines the rate of returns he wants an investment to generate if he must invest his money into such a venture. This, he tries to do, by forecasting future returns and dividing it by future return on capital employed. The result of this computation would then be compared with the investor's expected ARR. If the computed value is equal to or more than the expected accounting rate of return, it is worthwhile to invest but if not, then it is not worthwhile investing.

Formula For Valuation =   Estimated Future Profit / Return on Capital Employed.

Illustration 1

Kundera limited is considering acquiring Adedipo limited. At present Adedipo Ltd is earning an average of N700, 000 after tax. The director of Kudirat Ltd feels that after the reorganization, this figure could be increased to 1,000,000. All the companies in the Kudirat group are expected to yield a profit after-tax return of 21% on capital employed.

Compute the highest sum Kudirat Ltd should pay to acquire Adedipo Ltd.

Estimated Future Profit

Return on Capital Employed   =   1,000,000 = N4, 761,905

0.21

Highest money to be paid for acquiring Arisekola = N4,761,905

Price-Earnings Ratio (P/E ratio) - The price-earnings ratio is the most favoured tool for share valuations. P/E ratio is the ratio of share price to the ratio earned per share based on the business most recently published results.

Formula P/E ratio = MVS/EPS

MVS = Market value per share

EPS = Earnings per share

MVS = P/E ratio x EPS

If the computed P/E ratio is high, this means that investors have a high regard for the company's prospects and quality earning. Therefore the business should be invested in.

A low P/E ratio is an indication of low regard for the business earning and prospects. Therefore, investors tend to shy away from such investments. It also shows the dividend cover of such business is low which makes it risky for investors to invest in such.

Investors do not use P/E ratio to evaluate quoted share. Rather it is the measure of the relationship between the investor's valuation of a share and its earnings. Since the market transaction has already set the price of a quoted company's share, it could, therefore, be unnecessary to use P/E ratio to value a quoted company's share.

P/E ratio is suitable to value an unquoted company's share.

Summary:

i ARR may be used when a takeover bid is involved. The acquiring company can use ARR to determine the maximum amount to be paid for acquiring a business. The rate used against the estimated profit is the rate expected on the investment of the acquiring company in her investment in the acquired assets after the take-over or re-organization.

ii ARR is suitable for valuing a controlling interest in a very small business that is incomparable to a quoted company.

iii P/E ratio is appropriate for valuation of a quoted company's share.

iv Averagely, P/E ratio can account for growth while ARR cannot account for growth. Hence analysts often use a prospective P/E ratio.

9.08 Discounted Cash Flow

The acquiring company is buying a future stream of income; the purchasing company will compare its cash flow before acquisition and cash flow at post – acquisition. The difference needs to be estimated, discounted to the present value, and summed up to determine the net present value which is the maximum value of the business to be purchased.

Illustration 2

Alaska Plc wishes to acquire Hawaii Limited. Hawaii Ltd makes after-tax profits of N70, 000 per annum. Alaska Plc believes that by spending further money on an additional investment, the after-tax cash flow would be:

Year	cash flow (net of tax)
0	(180,000)
1	(120,000)
2	80,000
3	130,000
4	180,000

The after–tax cost of capital of Alaska Plc is 15% and the company expects all its investments to pay back in discounted value terms within 4years.

What is the maximum price that the company should be willing to pay for the shares of Hawaii Ltd?

Year	Cash flows	DC	PV

	N	15%	N
0	(180,000)	1.00	(180,000)
1	120,000	0.8696	104,352
2	80,000	0.7561	60,488
3	130,000	0.6575	85,475
4	180,000	0.5718	102,924
Maximum purchase price			**173,239**

Illustration 3

Using the financial statements and notes to the account in illustration 9.1, Estimate the value of the total equity of Kabba limited as at 31 July 2014 using

i. The Gordon dividend growth model

ii. The P/E ratio model

Solution:

i. The Gordon dividend growth model

Formula $rb=g$

r =Return on Investment

b =retention ratio/rate. This is the proportion of earning retained

g =growth rate

$b = \dfrac{\text{earnings-Dividend}}{\text{Earnings}}$

$= \dfrac{12,800+44,200+18,300+13,400+27,200}{33,300+66,800+43,300+38,400+52,200}$

$= \dfrac{115,900}{234,000}$

= 0.495%

= 0.50%

r= Return on investment this year = Profit before extra-ordinary item

Average Investment

= 53,200
_____
570,900-27,200

= 53,200
_____
543,700/2

Where N543, 700/2 is average investment

= 53,200   x100%
_____
271,850

= 0.195 x 100%

=20%

g= r x b

=50% x 20%

Growth = 10%

Using Gordon dividend growth model, we arrived at 10% growth rate.

ii. The maximum amount to be paid for acquiring Kabba a limited using P/E ratio:

Remember that the question says that Kabba limited is not quoted and smaller than its similar companies which are quoted and have P/E ratio of approximately 10.

Therefore let us assume Kabba P/E ratio is 5, 9 or the highest it could be 10. Let say 5

P/E ratio   =TMV/e
    =   Total Market Value
              Total earnings
TMV =P/E ratio x TE
        =5 x 53,200
        =N266,000
Let say 9
∴ TMV = P/E ratio x TE
        =9 x 53,200
        =N 478,800
The highest it could be is 10
TMV = P/E ratio x total earning for the year
      = 10 x 53,200 = N 532,000
The maximum possible amount is N532,000.

Each method will give a different business valuation. It is most unlikely that each method would be used in isolation, and several valuations may be made, each method using a different

technique or assumptions. The valuations may then be compared and a final price may be reached as a compromise between the different values.

9.09   Dividend Yield Method

Dividend yield basis is good for evaluating the value of small shareholding in an unquoted company. It is based on the assumption that the value of a share is the value of all the future dividend payment, discounted at a particular rate of shareholders time preference.
There are two approaches using gross and net dividend.
   a. Dividend without growth
   b. Dividend with growth

Dividend Without Growth
$Ke = d/MV$ $MV = d/Ke®$

Where
Ke = cost of equity capital/rate of return
D = dividend
MV = market value
If you are using gross then gross dividend = $\dfrac{\text{dividend (gross)}}{\text{Rate or return}}$

If you are using net = $\dfrac{\text{dividend (net)}}{\text{Rate of return}}$

Dividend With Growth:
$$\text{Growth Model} = MV = \frac{do(1 + g)}{r-g}$$

Share Price Method
Investors use the share price of the company's share quoted on the floor of the stock exchange to multiply the number of shares in consideration.

Berliner Method
This method used both the company's net assets and earnings to determine the company's value.
Value of net tangible assets   maintainable profits
(going concern basis)   Required rate of return

Super Profit Method
This method is more in vogue; it is a method of applying a "fair return" on the business net assets and then comparing the result with the expected profit. Excess profit derived (super profit) is said to form the foundation for the calculation of goodwill. The goodwill is normally taken as a fixed number of years' super profit. This is the point where super profit method of goodwill differs from the normal earning method, as normal earning method believes that the expected level of earnings will continue indefinitely.

Illustration 4
Ogesalude Limited has net tangible assets of ₦500,000 and present earnings of ₦70,000. Chief Mejabi Taofeek who considers that a "fair return" for this type of industry is 10%, has asked you a Certified National Accountant to value Ogesalude Limited taking goodwill at 4 years super profit.

Solution

		₦
Present earnings		70,000
Fair return on net tangible assets	(10% x 500,000)	50,000
Super profit		20,000
Goodwill: 4 x 20,000		100,000
Value of Ogesalude 500,000 + 100,000		600,000

The super profit method is a combination of ;
   i.   Net assets basis of valuation
   ii.   A type of earnings – based valuation for goodwill
Drawbacks to upper profit:
   i.   Subjective fair return
   ii.   Number of years' purchase of super-profit is arbitrary.

Dual Capitalization of Profit
Dual capitalization of profit has relation with the super profit method.

Formula:
Total valuation = value of net tangible assets + expected profit
        (Return required on net tangible assets x value of net tangible assets)
        Return required on tangible assets.

Illustration 5
It is been estimated that Kotex Limited has a sustainable profit of ₦350,000 per year. The expected yield on tangible assets is 12% and on intangible asset is 16%. The value of tangible assets is ₦2,100,000.
You are required to calculate the value of Kotex Limited using capitalization of profit method of business valuation.

Total value = 2,100,000 + $\frac{350,000 - (0.12 \cdot 2,100,000)}{0.16}$

= 2,100,000 + $\frac{350,000 - 252,000}{0.16}$

= 2,100,000 + $\frac{98,000}{0.16}$ = ₦2,712,500

The rigorous calculation involved in this method does not make it provide better accurate figure neither does it provide worse a figure for a business value.

The drawback of this method is the subjectivity of the rate of returns on both tangible and intangible assets.

Right Issues, Reverse Stock Split and Script Issues

a. Right Issues

Rights issue refers to the privilege given to existing shareholders to buy unsubscribed shares of the company with cash. The numbers allotted to each shareholder would be in the proportion of his shareholding. When all the shareholders take up their right, it shows that the company is making impressive progress. Right issues make a company avoid the issuing cost if finance is to be obtained from the public. The issue price is always below the prevailing market price. Right issues allow a company to raise additional capital without changing the relative proportions in which the company is owned before the issue.

b. Share Split

This is a process whereby a share market value is reduced to increase the number of authorized share capital. For example

1,000,000 ordinary share @N1 each may be split to 2,000,000 ordinary share @ 50k each.

c. Reverse Stock Split

This is the opposite of share split. E.g. 1,000,000 ordinary share @ N1 each may be reversed to N5,000,000 ordinary share @ 2 each.

d. Script Issues

This is the capitalization of reverses of a company by the issues of additional shares to existing shareholders in proportion to their holdings, usually at no cost.

A script issue is also called bonus issue or capitalized issue. The declaration of bonus or capitalization issue will increase the paid up share capital and reduce the reserves and surplus of the company. The total worth of the company is not affected by the script issue.

9.10   Review Questions

1. Examine why a business need to be valued and what are the bases for valuing a business.(5mark).
2. Discuss funds flow statement and why are they necessary. (5marks)
3. Determine the best mathematical formula for valuing a business and why do you think so? (5marks)
4. Enumerate and evaluate some basic issues in financial statement analysis.(5marks)
5. Analyse the various methods of valuing a business that is about to be acquired. (5marks)

MODULE 10

10.00   **WORKING CAPITAL MANAGEMENT**

10.01   Learning Outcomes

On successful completion of this module, students should be able to:

     i   Assess the importance of the availability of working capital;

     ii   Calculate the length of a working capital cycle;

     iii   Evaluate the danger, symptoms, causes, and remedies of overtrading;

     iv   Analyse the tools for efficient management of inventory, cash and   receivables; and

     v   Appraise the various means of financing working capital.

10.02   Working Capital Policy

To Pandey (2007), Working Capital policy is critical for all companies, especially the small ones. A small company may not have much investment in fixed assets but it has to invest in current assets. There exists a direct relationship between a company's growth and its working capital needs.

Therefore, for a company to have an optimum working capital policy, it should be designed to achieve the following goals:

     a. Adequate Working Capital

     b. A company should have sufficient working capital that will allow it to pay its bills promptly and conduct its day-to-day operations without any hitch.

     c. Maximization of Risk

     d. A company should select financing sources, payables and other short-term liabilities that relatively involve low costs and other favourable terms. The company must ensure that those liabilities/short-term obligations are kept at the minimum possible compared to the current assets at hand to settle them

   ii   Maximizing the Company's Value

     a. The company should hold working capital for the same goal as it holds any other asset, that is, to maximize the present value of ordinary shares and the value of the company. It should not hold excess inventory which increases carrying costs. It should speed up collections of receivables and invest excess liquidity for the growth of the company.

Factors that determine the requirements of a company's working capital include:

1.   Sales Volume- A company experiencing a steady level of sales operates with a fairly constant level of inventory, cash and receivables, if properly managed. A company experiencing growth in sales needs additional current assets, but if sales are declining, a reduction in current assets is expected.

2.   Seasonal and Cyclical Factors- Fluctuations in demand affect the level of current assets of the company. The overall economy also undergoes financial and business cycles, which greatly affect the operations of companies.

3.   Technological Innovations- The need for working capital can be greatly influenced by developments and innovations in technology, particularly as it relates to the production   process.

4.   Policies of the Company- Some of the policies of the company affect the level of investment in current assets. For example, if the company changes its production policies or stock safety levels inventory requirements may be affected. If the company changes its credit policy, say from net 30 to net 45, additional funds may be tied up in receivables. So also is the safety level of cash on hand is charged, the levels of variable working capital may be affected.

10.03 Cash Budget/Cash Flow Forecasts

A full understanding of what cash flow is and how it impacts profit is central to operating a successful small business. Although profit may be the ultimate goal, it can't become a small-business owner's sole focus, because, without a successful cash management plan, profit can be meaningless. Cash budgeting, cash flow forecasting, and cash account analysis are crucial for preventing a situation in which a small-business owner reports a profit on paper but at the same time is facing bankruptcy.

1.   Cash Budgeting

Cash budgeting is a process of predicting cash inflows and allocating cash outflows for a specific time period. For this reason, cash budgeting relies heavily on accurate cash flow forecasts. It also requires effectively managing activities such as customer billing and collections, short-term investment and accounts payable disbursements. The goal is to strike a cash reserve balance that is neither too much nor too little but still allows the business to pay its daily operating expenses. Strategies for achieving this goal include accelerating cash inflows and delaying cash payments until they come due, investing excess cash reserves to earn an acceptable rate of return and, when necessary, borrowing cash at good credit terms.

Illustration 1

Taruku Mills Ltd produces high-quality cooking oil. From the information provided below, you are required to prepare a cash budget for the company.

i. The cash balance in hand on January 1, 2014 is N725,000
ii. Assume that 50% of total sales are cash sales.
iii. Assets are to be procured in the months of February and April. Provision should be   made for the payment of N80, 000 and N250, 000 for the same.
iv. The company has instructed the finance manager to apply in principle to grant the loan facility in May.
v. It is projected that a dividend of N350, 000 will be paid in June.
vi. Debtors are allowed one month's credit
vii. Creditors for soybeans procured and overheads grant one month's credit.
viii. Sales commission at 3% on sales is paid to the salesman.

Month	Sales Units	Materials Purchases ₦	Salaries & Wages ₦	Production Overheads ₦	Office & Selling OH ₦
January	720,000	250,000	100,000	60,000	55,000
February	970,000	310,000	121,000	63,000	67,000
March	860,000	250,000	106,000	60,000	75,000
April	886,000	306,000	250,000	65,000	89,000
May	1,025,000	370,000	220,000	80,000	110,000
June	1,087,000	388,000	230,000	82,000	115,000

Solution

CASH BUDGET

	Jan. ₦	Feb. ₦	March ₦	April ₦	May ₦	June ₦	TOTAL ₦
Receipts							
Cash Sales	360,000	485,000	430,000	443,000	512,500	543,500	2,774,000
Collection from debtors	-	360,000	485,000	430,000	710,750	512,500	2,230,500
Bank Loan	-	-	-	-	300,000	-	300,000
	360,000	795,000	915,000	873,000	1,255,500	1,056,000	5,304,500
Payments							
Materials	-	250,000	310,000	255,000	306,000	370,000	1,491,100
Salaries & Wages	100,000	121,000	106,000	250,000	220,000	230,000	1,027,000
Production Overheads	-	60,000	63,000	60,000	65,000	80,000	328,000
Office and Selling Overheads:	-	55,000	67,000	75,000	89,000	110,000	396,000
Sales commission	21,600	29,100	25,800	26,580	30,750	32,610	166,440
Capital expenditure	-	80,000	-	250,000	-	-	330,000
Dividend	-	-	-	-	-	350,000	350,000
	121,600	595,100	571,800	916,580	710,750	1,172,610	4,088,440
Net Cash Flow	238,400	249,900	343,200	(43,580)	544,750	(116,610)	1,216,060
Bal.- Begin of Month	725,000	963,400	1,213,300	1,556,500	1,512,920	2,057,670	1,941,060
Bal.- End of Month	963,400	1,213,300	1,556,600	1,512,920	2,057,670	1,941,060	3,157,120

2.   Forecasting Cash Flows

Cash flow forecasts aim to predict future financial liquidity over a specific period of time. A new small-business owner or one just getting started with creating cash flow forecasts may want to consider starting with short-term forecasts. Short-term cash flow forecasting is based on actual cash receipt and disbursement data, while long-term cash flow forecasts are projections based on data from the income statement and balance sheet. Not only are long-

term forecasts more difficult to complete, but because long-term forecasts are based on estimated projections, the longer the forecast time frame the greater chances are for inaccurate projections. In addition, if the business is or will soon be undergoing a period of rapid growth, long-term cash flow forecasts can become even more inaccurate. SCORE, a group sponsored by the U.S. Small Business Administration, has a free 12-month cash flow forecast template available for downloading at Score.org.

3.   Creating A Short-Term Cash Flow Forecast

A short-term cash flow forecast spanning a period of 12 months or less starts and ends each month with the beginning and ending cash balances for the month. Organize spreadsheet sections to include cash on hand, cash receipts, cash payments and cash position at month end. Gather revenue and expense data for the previous six-month period. Then, base the first six months of the cash flow forecast on the data for this six-month period and the next six months on cash flow projections. Cash receipts include money flowing into the business from sales revenues, loan proceeds, capital asset sales and any money the business owner invests in the business. Cash disbursements include operational expenses, short-term debt or credit card payments and any money the business owner withdraws from the business.

4.   Account Analysis

A monthly statement of cash flows is an essential analysis tool. The analysis involves looking for trends and patterns and using this information to prepare meaningful budgets and forecasts as well as make important business decisions. A statement of cash flow classifies cash inflows and cash outflows according to whether they originate from operating, investing or financing activities. When conducting a cash flow analysis, start by reviewing cash flow from operating activities. Analysis can help determine, for example, whether the business is generating enough cash from sales revenues or whether it needs to consider other sources of funding, such as a short-term loan during a seasonal sales decline. A review of cash inflows from investing activities can indicate whether the business is investing excess funds to grow the business or whether growth is stagnating. A financing activities analysis is a major indicator of whether the business has a good cash management plan. Frequent borrowing and injections of outside capital can indicate the business is financially unstable.

10.04   Cash Management Models

The cash management models attempt to determine the minimum balance that will be adequate to meet the firm's cash needs. Two of such models namely. Baumol model and Miller and Orr model will be discussed.

Baumol cash Management Model
Baumol's model of cash management is adapted from the inventory control model. The model assumes that stock is made up of two commodities, namely, cash and marketable securities.

Other assumptions of the model are that:

a. Payments are certain and steady over time
b. Only transaction demand for cash is relevant.
c. There are no other cash receipts except from the sale of marketable securities.

With these assumptions on the background, the model reasons that the reservoir of cash is steadily drawn down and when the firm runs out of cash, it replenishes it by selling marketable securities. The carrying cost of holding cash is taken as the foregone interest in marketable securities. Thus the higher the volume of cash balance held, the higher the cost. The ordering cost of replenishing cash is taken as the fixed administrative expenses each time cash is replenished through the sale of marketable securities. Consequently, the larger the amount in each replenishment, the lower the unit cost per naira replenished.

Based on the foregoing, the optimum amount of cash in each replenishment Q is expressed as:

$$Q = \frac{\sqrt{(2\,b\,M)}}{1}$$

Where M = Total amount of cash payment in the year
b = Cost each time marketable securities are sold to replenish cash balance.
i = Opportunity cost of fund held as cash. (That is interest rate)   .

if we assume for example, that total cash payment over the period is N12.6 million; opportunity cost of funds 8 percent; and that the fixed cost of replenishing cash each time marketable securities are sold is N200, we can obtain the optimal amount of cash for each replenishment as:

$$\text{Optimum Amount of cash} = \frac{\sqrt{2 \times ₦12,600,000 \times ₦200}}{8\%}$$

$$= \frac{\sqrt{5,040,000.00}}{0.08}$$

$$= \sqrt{63,000,000,000}$$

$$= \underline{₦250,998}$$

The interpretation is that the firm will sell marketable securities worth ₦250,998 each time it replenishes cash. This translates to an average cash balance of ₦125,499. (That is ₦250,998 ÷ 2).

Given a total annual cash payment of ₦12.6 million that is paid out steadily and evenly over the period, the monthly cash payment will amount to ₦1.05 million. (That is, ₦12.6m÷12). The

firm will therefore replenish cash about four times a month. (That is, ₦1.05 million ÷₦250,998) which is once a week.

If the interest (carrying cost) increases, the firm will want to hold smaller average cash balance. For example, if the interest rate is doubled to 16 percent while others remain unchanged, the optimum amount of cash for each replenishment will change as follows:

Optimum amount of cash $= \dfrac{\sqrt{2 \; x \; 12,600,000 \; x \; 200}}{16\%}$

$= \dfrac{\sqrt{5,040,000.00}}{0.16}$

$= $ ₦177,482.4

The average cash balance will correspondingly reduce to ₦88,741.2 (That is, ₦177,482.4 ÷ 2).

If the cost of selling marketable securities in each replenishment is very high, the firm would want to sell a higher value of marketable securities to reduce the number of times replenishment will be required in the year. To illustrate, assume that the fixed cost of selling marketable securities in each replenishment is doubled from ₦200 to ₦400, and others remain unchanged, the new optimum amount of cash for each replenishment will be calculated as follows:

Optimum amount of cash $= \dfrac{\sqrt{2 \; x \; 12,600,000 \; x \; 400}}{8\%}$

$= \dfrac{\sqrt{10,080,000,000}}{0.08}$

$= $ ₦354,964.8

And the average cash balance will be ₦177,482.4. (That is ₦354,964.8 ÷2). The number of replenishments to be made in a month will reduce from about four times to about three times, that is ₦1,050,000 cash payment per month divided by ₦354,964.8, the amount for each replenishment.

We can summarise by saying that high interest rate creates pressure for a lower cash balance but with frequent replenishment. On the other hand, high cost of selling marketable securities for each replenishment creates pressure for high cash balance and infrequent sale of securities.

The model is based on the assumption that payments are certain and s time. This is at variance with reality. In practice, payments are usually varied from time to time and no such saw-toothed pattern exists. For instance, in a particular week, the firms could receive a lot of

payments from its customers and thereby record a net cash inflow while in another week; it could make a lot of payments to its suppliers and thereby record a net cash outflow.

The model concentrated on payments and assumed that there are no other cash receipts except from the sale of marketable securities. This again is a defect. The defect can, however, be cured by assuming that M in the equation represents net payment, that is, gross payments minus receipts. But even then, the assumption of even flow of cash payments is not also cured. We can, therefore, conclude that the model can provide an approximate device for determining average minimum cash balance, only to the extent that net payments are constant over the period. This does not however accurately represent the behavior of cash balances in reality.

Miller and Orr Model

Miller and Orr provided a more realistic cash management model which allows for the possibility of both cash inflows and cash outflows. The model assumes that the net cash flow (inflows minus outflows) are random in direction and that the outcomes form a normally distributed probability curve provided the number of outcomes is large enough. On the premise that the day to day cash inflow cannot be predicted, Miller and Orr reasoned that the firm should manage its cashflows as shown in figure 3.1 below.

Cash
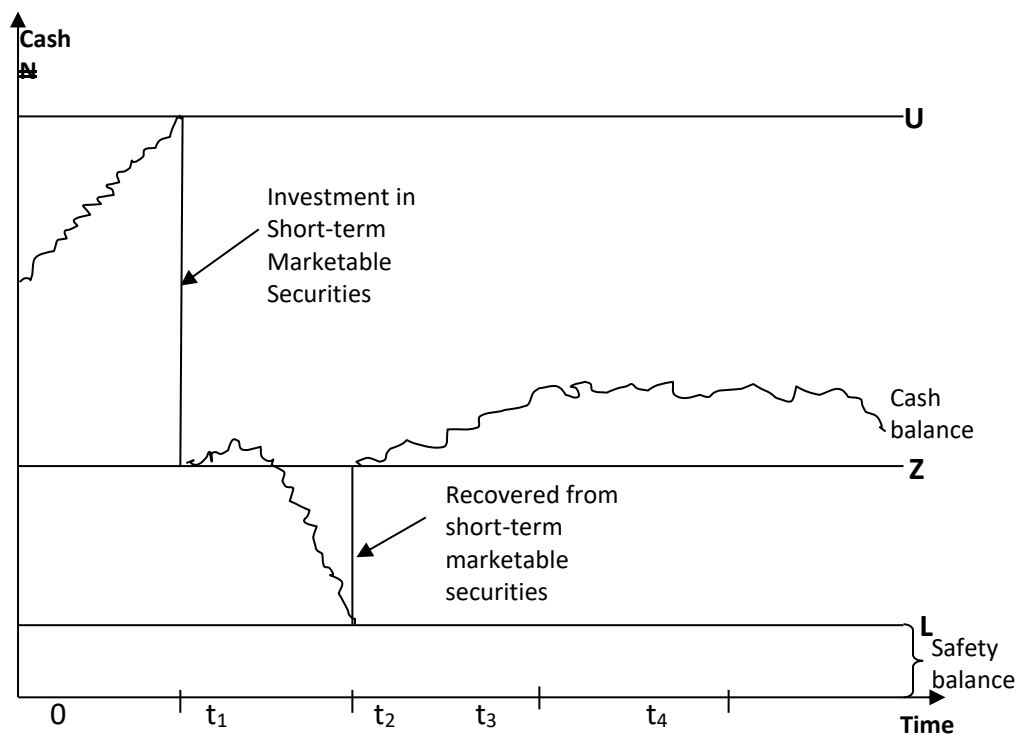
Miller and Orr Model

As indicated in the graph, there are two limits, the upper limit U and the lower limit L. Cash balance is allowed to meander unpredictably within the limits set by lines U and L. As it reaches the upper limit, it is reduced to Z, the return point by buying additional marketable securities. Thereafter, the cash balance again wanders randomly until it reaches the minimum cash

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balance level at L. At this point, enough marketable securities are sold to push the cash balance back to Z the return point. Put differently, the cash balance is allowed to wander unpredictably until it reaches either the upper limit U or the lower limit L. In the case of the upper limit, it reduced to the desired balance Z by the purchase of additional marketable securities. But in the case of the lower limit, it is restored to the return point Z by the sale of marketable securities.

The limits within which the cash balance should be allowed to wander randomly depend on the rate of variation in cash flow and the fixed cost of buying and selling marketable securities. Thus if the day to day variation in cash flow is large, or the fixed cost of buying and selling securities is high, then the control limits (distance between U and L) would be far apart. On the other hand, if the rate of interest is high, the limit would be closed together. The spread between the upper and lower limit can be obtained as.

Spread between $= 3 \left\{ \dfrac{\text{¾ x transaction cost x variance of cash flow}}{\text{Interest rate}} \right\}^{1/3}$
Upper and lower
limits

notice that the return point Z, is not halfway between the upper limit U and the lower limit L. it is actually one-third the distance between L and U. that is:

Return point = Lower limit + $\dfrac{\text{Distance between L and U}}{3}$

If the firm starts at the return point Z, the lower limit will be hit more often than the upper limit. But this will not minimize the number of transactions. If the firm were always to start from the middle of the spread, it will entail holding larger cash balances and incurring larger interest costs. The model's return point minimizes the sum of the transaction costs and interest costs.

The expected cost E© at any given level of cash balance is given as:

    E©   = $\dfrac{b\,E(N)}{T} + iE(M)$

Where b   =   Transfer cost between cash and marketable securities.
   E(N)   =   The expected number of transfers between cash and marketable
          securities.
   T   =   Number of days in the planning period.
   i   =   Daily rate of interest on marketable securities.
   E(M)   =   Expected average cash balance

Our objective is to minimize E© by choosing appropriate values for U and Z. We assume a special case in which the probability that the cash balance will increase is equal to the probability that it will decrease. That is probability = 0.5 and no other outcomes are possible. By Miller and Orr model, the proposed solution is

$$Z = \frac{3\sqrt{3b\acute{O}^2}}{4i} \qquad U = 3Z$$

Where Z = Optimal return point
b   = Transfer cost between cash and marketable securities.
i   = Daily rate of interest on marketable securities.
$\acute{O}^2$ = variance (square of standard deviation) of daily changes in cash
         balance.

And once Z is estimated, U will be three times greater.

As an illustration, assume the following:
Transfer cost   =   N30
Variance   =   0.3
Opportunity cost of funds=   0.0005 per day.

The optimal return point Z is obtained as follows:

$$Z = \frac{\sqrt[3]{3 \times N30 \times 0.3}}{4 \times 0.0005}$$

$$\frac{\sqrt[3]{27}}{0.002}$$
$$= \quad N1500$$

Then U = 3Z
   =   3 x N1,500
   =   N4500

When the cash balance hits U level, that is, N4500 in our illustration above, the financial manager should buy additional marketable securities to the extent of 2Z, that is N3,000, in order to reduce the cash balance to Z the optimal return point. If the cash balance falls to L level, the financial manager should sell marketable securities to the extent of Z, that is, N1500 to push up the cash balance to Z.

The model uses variance as a measure of variability. This is not entirely appropriate if large short-term fluctuations occur and if the perennial problem of quality of data persists, though the use of cube root will reduce the effect. Also, the model does not recognize the possibility of borrowing instead of selling marketable securities.

10.05   Operating Cycle

The operating cycle is also known as the cash conversion cycle. In the context of a manufacturer, the operating cycle has been described as the amount of time that it takes for a manufacturer's cash to be converted into products plus the time it takes for those products

to be sold and turned back into cash. In other words, the manufacturer's operating cycle involves:

i   paying for the raw materials needed in its products
ii   paying for the labor and overhead costs needed to convert the raw materials into products
iii holding the finished products in inventory until they are sold
iv   waiting for the customers' cash payments for the products that have been sold
v   Some calculate the operating cycle to be the sum of:
vi   the days' sales in inventory (365 days/inventory turnover ratio), plus
vii the average collection period (365 days/accounts receivable turnover ratio)

The above sum is sometimes reduced by the number of days in the credit terms of the accounts payable.

The operating cycle has importance in classifying current assets and current liabilities. While most manufacturers have operating cycles of several months, a few industries require very long processing times. This could result in an operating cycle that is longer than one year. To accommodate those industries, the accountants' definitions of current assets and current liabilities include the following phrase: ...within one year or within the operating cycle, whichever is longer.

The operating cycle is the average period of time required for a business to make an initial outlay of cash to produce goods, sell the goods, and receive cash from customers in exchange for the goods. This is useful for estimating the amount of working capital that a company will need in order to maintain or grow its business.

A company with an extremely short operating cycle requires less cash to maintain its operations, and so can still grow while selling at relatively small margins. Conversely, a business may have fat margins and yet still require additional financing to grow at even a modest pace, if its operating cycle is unusually long. If a company is a reseller, then the operating cycle does not include any time for production - it is simply the date from the initial cash outlay to the date of cash receipt from the customer.

The following are all factors that influence the duration of the operating cycle:

i   The payment terms extended to the company by its suppliers. Longer payment terms shorten the operating cycle, since the company can delay paying out cash.
ii   The order fulfillment policy, since a higher assumed initial fulfillment rate increases the amount of inventory on hand, which increases the operating cycle.
iii The credit policy and related payment terms, since looser credit equates to a longer interval before customers pay, which extends the operating cycle.

Thus, several management decisions (or negotiated issues with business partners) can impact the operating cycle of a business. Ideally, the cycle should be kept as short as possible, so that the cash requirements of the business are reduced.

Examining the operating cycle of a potential acquiree can be particularly useful, since doing so can reveal ways in which the acquirer can alter the operating cycle to reduce cash requirements, which may offset some or all of the cash outlay needed to buy the acquiree.

This is the time duration required to convey sales after the conversion of resources into inventories, into cash. The operating cycle of a manufacturing company involves three phases:

 i Acquisition of resources such as raw materials, labour, power and fuel etc.
 ii Manufacture of the product which includes the conversion of raw materials into work-in-progress into finished goods.
 iii Sale of the product either for cash or on credit. Credit sales create an account receivable for collection.

Put in another way, we can say that, the operating cycle is the length of time it takes to acquire an inventory of raw materials, convert them to finished products, sell them and collect cash from sales. This operating cycle begins life as inventory. It is converted to accounts receivables when it is sold and it is finally converted to cash we collect cash from sales.

The cash cycle is the number of days that pass before we collect the cash from sales measured from when we actually pay for the inventory. Cash cycle is, therefore, the difference between the operating cycle and the accounts payable period.

The operating cycle may be expressed as a period of time:

1. Raw materials stocks are obtained from suppliers
2. Eventually, the trade creditors are paid and cash is therefore paid out.
3. Raw materials are held in stock until they are issued for production (work-in-progress). At this time, additional creditors for labour and other accrued expenses may be incurred.
4. On completion of production, the finished goods are held in stock until sold, perhaps on credit
5. Cash is received, eventually, when the debt is collected,
6. The operating cycle is, therefore, the period between the payment of cash to creditors [cash out] and the receipts of cash from debtors [cash in]

As the turnover periods for stocks and debtors get longer and as payment period to creditors becomes shorter:

 i the operating cycle will lengthen, and

ii   the investment in working capital will increase
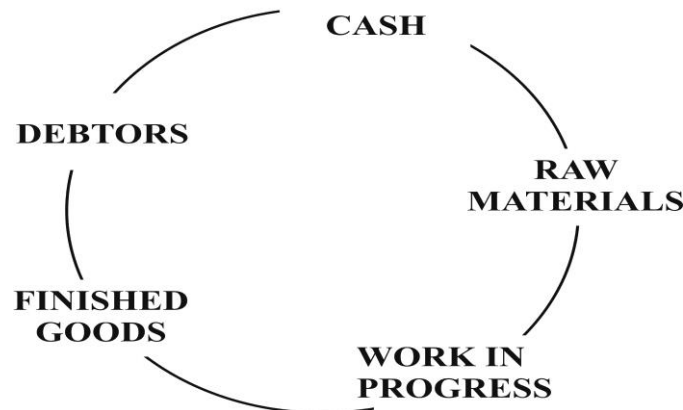
Operating/Cash/Working Capital Cycle

Working capital cycle is the interval between the payment of cash to creditor (i.e. cash outflow) and the collection of cash from debtors (i.e. cash inflow).

cash

Turnover Period Calculator

a.   Raw Materials = Average Raw Material   x   12months or

Annual Purchase P/A 52weeks or 3   Raw Materials

b Debtors   n progress   =   Average WIP

Cost of production

c.   Finished goods   = Average finished good   x   12months or

Cost of sales p.a   52weeks or 365days

d.   Debtors Turnover Period = Average Debtors x 12months or

(A
Finished goods

Working in Progress

verage Collection Period) Credit Sale p.a   52weeks or 365days

e.   Creditors Turnover Period =   Average Creditors x   12months or

Credit Purchase p.a 52weeks or 365days

When you are not given credit sales or credit purchase or both, sales and purchases are alternatives

Illustration 10.4

Given below is the information from the annual account of Jakura Marble Industry Limited for the past 3 years

Jakura Marble Ltd – Extract from annual accounts

	Year 1	Year 2	Year 3
Inventory			
Raw Material 100,000	130,000	160,000	
W-I-P	70,000	80,000 8	5,000
Finished goods	80,000	120,000	140,000
Purchase	500,000	700,000	710,000
Cost of goods sold	750,000	970,000	1,080,000
Sales	800,000	1,070,000	1,150,000
Receivables	170,000	250,000	290,000
Payables	80,000	100,000	120,000

You are required to:

a. Calculate the length of the working capital cycle year by year assuming 365 days in the year
b. List ways of reducing the length of operating cycle and possible disadvantages of each

Solution

	Year 1	Year 2	Year 3
1 Raw Material	72	67.8	82.3
2 W-I-P	34	30	28.7
3 Finished goods	38.9	45.2	47.3
4. Debtors T/O Period (ACP)	77.6	85.3	92
5. Creditors T/O Period (APP)	(58.4)	(52.1)	(61.7)
Total length of cycle	164.1	176.2	188.6

Working for year 1

1. Raw Materials   RM Stock   x 365days

Purchase

$$= \quad \frac{100{,}000}{500{,}000} \times 365\text{days} \quad = \quad 72\text{days}$$

2.   W-I-P $\dfrac{\text{W-I-P}}{\text{Cost of Sales}} \times 365\text{days}$

Note- since there is no cost of production, cost of sales is a credible alternative

$$= \quad \frac{70{,}000 \times 365\text{days}}{}$$

$$= \quad 750{,}000$$

3   Finished Goods=$\dfrac{\text{Finished goods}}{\text{Cost of sales}}$ = $\dfrac{80{,}000 \times 365}{750{,}000}$

4.   Debtors Turnover Period or Average Collection Period

     $\dfrac{\text{Receivable}}{\text{Sales}}$ = $\dfrac{170{,}000 \times 365\text{days}}{800{,}000}$ =   77.6

5.   Creditors Turnover Period or Average Payment Period

     $\dfrac{\text{Payable}}{\text{Purchase}}$ x 365 $\dfrac{80{,}000 \times 365\text{days}}{500{,}000}$ =   58.4

c.   Reduction in the length of the cycle can be achieved by reducing the length of the cycle of any raw materials, working-in-progress, finished goods and debtors viz:

    i.   You can delay payment for raw material purchased. The effect being loss of goodwill as you cannot pay as promised by you. You also lose a discount that is supposed to go along with prompt payment.

    ii.   You can also speed up production or you reduce the production volume that is supposed to be produced. *Effect, the laborers in the event of speeding up they tend to produce vastly. The problem of laborer not ready to change the ways they have been used to.*

    iii.   Reducing the holding of finished inventory - This may lead to stock out which perpetual stock-out bring down a company's goodwill

    iv.   Credit facilities extend to customers should be reduced – Effects is the customers may divert their patronage elsewhere.

Illustration 5

The sales manager of Jakura Marble Limited estimates that if the period of credit allowed to debtors was cut down to 50days, it would result in a 20% reduction in sales level but

would probably eliminate about N40,000 per annum on bad debt. It would be necessary to spend an additional N30, 000 p.a on credit control. The company at present relies on overdraft finance costing 11% per annum

You are required to make calculations showing the effect of these changes and to advise whether they would be financially justified. Based your answer on the three (3) levels of sales and assume that purchases and inventories holding would be reduced proportionally to the reduction in sales value.

Solution

A cost/benefit analysis of the change must be carried out before a decision can be made

Presently: Sales   1,150,000
                Cost of goods (1,080,000)
                Gross profit   70,000

If sales are reduced by 20%, the cost of sales shall reduce by 20% and also gross profit by 20%

20% x 70,000   =   14,000

The overall effect on annual cash flow   ₦

Bad debt eliminated   40,000

Credit Control Cost   (30,000)

Gross Profit Forgone   (14,000)

Net Cost to be borne   (4,000)

    Cost of the new policy   =   N4, 000

Working Capital Freed is:

        Reduction in inventory   ₦

        Raw materials   20% x 160,000   32,000

        Work in Progress   20% x 85,000   17,000

        Finished goods   20% x 140,000   28,000

        Reduction in   receivable   (wk 1)   163,913

        Reduction in   Payable 20% x 120,000   (24,000)

                                                     216,913

Let us now calculate the overdraft interest saving as a result of work capital of N216, 913 freed (i.e. not needed)

            =   N216, 913 x 0.09   =   19,522

The now decision should be prima facie implemented since the saving of N19, 522 excess the cost of N4, 000 of implementing the scheme

Working 1	N
Current Receivable	290,000
Revised Receivable 80% x 290,000 50/92	(126,087)
	163,913

10.06   Debtor and Creditor Management Techniques including: Credit Evaluation, Terms of Credit Settlement Discounts, Debt Collection Techniques, Factoring and Invoice Discounting

Debt Collection Procedures

The three main areas which out to be considered in connection with the control of debtors:

1. Paperwork
2. Debt collection
3. Credit control

Sales paperwork should be dealt with accurately:

i   Invoices should be sent out immediately after delivery
ii   Checks should be carried out to ensure invoices are accurate; this should be done by a senior officer.
iii   The investigation of queries and complaints and if appropriate, the issue of credit notes should be carried out properly.
iv   Monthly statements should be issued early so that all items on the statement then are included in the customers' monthly settlement of bills.

The use of pre-printed letters to remind customers to pay their debts is grossly ineffective. It is better to adopt a personal approach. A good method of positive debt collection may include the following stages:

i   Request for payment by telephone
ii   Send an e-mail
iii   Personal visit by sales representative
iv   Withdrawal of credit facilities
v   Place debt in the hands of a debt collection agency
vi   Lastly take legal action.

Credit terms: Are the stipulations under which a company sells on credit to customers. These stipulations include:

i. **Credit period:** the length of time which credit is extended to customers, which is generally stated in terms of a net date, for example a company's credit terms might be expressed to settle his accounts i.e. repay his credit obligation not later than 30days.

ii. **Cash discounts:** this refers to a reduction in payment offered to customers to induce them to speed up repayment of their credit obligations within a specified period of time, which will be less than the normal credit period, and which is usually expressed as a percentage of sales. For example, the company changes its terms from net 30 to $^2/_{10}$ net 30 meaning that, a 2% discount is allowed if the bill is paid within 10 days of the invoice date. This may attract customers who want to take advantage of the discount given, thereby increasing gross sales.

Generally, companies use cash discount as a tool to increase sales and accelerate the pace of collections from customers.

Management of Creditors

The management of creditors consists of:

i   Attempting to obtain satisfactory credit from suppliers

ii   Attempting to extend credit during periods of cash shortage

iii   Maintaining good relations with regular and important suppliers

If a supplier offers a discount for the early payment of debts, the evaluation of the decision whether or not to collect the discount is similar to the evaluation of the decision whether or not to offer a discount. Thus, one problem is the mirror of the other.

The financial crisis means that businesses must take control of their debtors to ensure they don't end up in difficulties.

Falling turnover due to a slowing economy are indicators of trouble for any business. If your customers are having these problems, there is a chance that they will be unable to meet their financial obligations to you.

Setting up credit controls and better managing debtors will improve your chances of payment when things go wrong for customers.

If they know you mean business, and if you take the appropriate steps in a disciplined manner, they are more likely to pay on time.

Many business owners are concerned about taking a disciplined approach to debt collection as they are afraid of losing the customer. But if customers are not meeting their payment obligations, they are not worth having.

The following three steps should be implemented to exercise appropriate controls over debtors:

1. Set up credit controls

i   Have a process in place and follow it.

ii Encourage customers to make payments directly to your bank account.

iii Use references and reports to check credit ratings for new customers, particularly those placing big orders from the outset. Such checks should identify customers that have had bad credit records in the past, so that they can be declined or closely monitored.

iv Set terms of trade and stick to them. It's much easier to follow up on slow payers if your trading conditions have been clearly laid out from the beginning. Rank debtors by value and risk, and monitor accounts accordingly.

2. Manage debtors

i   Follow up on all slow payers.

ii Deal direct with decision-makers at the customer. Monitor collections and follow up immediately if payment schedules are not met.

iii Automatically send 30-, 60-, and 90-day reminder letters. Insist on your trade terms being met.

iv Visit them if payments are not made on time and don't leave the premises without their commitment.

v   Don't rely on one visit. Maintain follow up if necessary, including regular telephone reminders. Don't finish the call without obtaining a firm commitment to make a payment. Follow up again if it is not paid on the promised date, or better still, arrange to pick up the cheque.

vi Review credit ratings regularly for any changes in buying habits and increasing levels of debt. Long-standing customers can be the greatest credit risk, because no one thinks to check on them.

vii If you don't get invoices out promptly, it encourages customers to delay payment. Delivery systems should also be checked. For instance, do you keep signed delivery dockets so that you can prove delivery?

viii Keeps an eye on customers expanding quickly? A growing customer may help your sales, but rapid growth also puts pressure on the customer's management and may increase risk. Make sure they continue to pay promptly.

ix Be careful when handling any requests for extended credit. Check out the customer's ability to survive and make a commercial decision based on the available information.

3. Deal with problem customers

i   Look out for warning signs that customers are experiencing difficulties. Sometimes they are not easy to recognise. For instance, while the sales team may want to claim credit for any increase in a customer's ordering, the new business the customer is giving you may be the result of other suppliers removing credit facilities. Industry gossip about a company's financial position is often surprisingly accurate.

ii   It is important to get difficult debtors to admit they have problems in paying and to then obtain a firm commitment for an amount to be paid against the account. When possible, get this commitment in writing or write to them confirming their commitment.

iii If accounts are not being paid, supplies should be stopped. This should be part of your credit system. You can then discuss the situation with your customer, and perhaps reach an understanding regarding payment for past supplies and conditions for new supplies.

iv   Don't put off sending professional demand letters or threatening legal action.

v   Discuss your policy and the credit limits you are applying up front so customers know you are serious about your collection program.

vi   If necessary, use a professional debt collector and be prepared for the possibility of going to court.

Important information: This content has been prepared without taking account of the objectives, financial situation or needs of any particular individual. It does not constitute formal advice. For this reason, any individual should, before acting, consider the appropriateness of the information, having regard to the individual's objectives, financial situation and needs and, if necessary, seek appropriate professional advice.

10.07   Inventory Management

Inventories constitute the most significant part of current assets of most of big companies. On average, inventories rank 50% of current assets in companies like Dangote PLC. Due to the large size of inventories kept by the companies, a considerable amount of money is required to be committed to them. It is therefore imperative to manage inventories efficiently and effectively in order to avoid wastage.

Nature of Inventories: Inventories is stock of the product a company is manufacturing for sale and components that make up the product. Inventories exist in a manufacturing company in the following forms:

i   **Raw materials:** These are the basic inputs that are converted into finished products through a manufacturing process. Raw material inventories are procured and stored for future production.

ii   **Work-in-progress:** These are inventories of semi-manufactured products. They are products that need more work before they become finished products for sale.

iii **Finished goods:** These are completely manufactured products which are ready for sale.
   a. The three levels/types of inventories depend to a large extent on the nature of business of the company. A manufacturing company will have the three levels of inventory, while a wholesale company will have a large quantity of finished goods inventory and no raw materials and work-in-progress.
   b. Some companies sometimes hold the forth type of inventory.

iv   **Supplies or Stores and Spares:** Supplies include office and plant cleaning materials like soap, brooms, oil, fuel and lubricants, etc. They are necessary for production process. Spares are the spare parts bought and kept for maintenance of plant and machinery in a manufacturing company like Dangote Cement Plc.

v   Need to Hold Inventories

Companies hold inventories for three main reasons:

Transaction motive
Inventories are maintained to facilitate smooth production and sales operations.

Precautionary Motive: This necessitates holding of inventories to guard against the risk of unpredictable changes in demand and supply forces and other factors.

Speculative Motive: This influences the decision to increase or reduce inventory levels to take advantage of price fluctuations.

Objectives of Inventory Management

The company is faced with the problem of meeting two conflicting needs:

i   To maintain a large size of inventories of raw materials and work-in-progress for efficient and smooth production and of finished goods for steady sales operations.

ii   To maintain a minimum investment in inventories to maximize profitability.

Both excessive and inadequate inventories are not good. Therefore, the objective of inventory management should be to determine and maintain optimum level of inventory investment.

The major dangers of over investment in inventories are:

i   Unnecessary tie-up of the company's funds and loss of profit,

ii Excessive carrying costs

iii Risk of liquidity

Inadequate level of inventories is also dangerous because of

i   Production holdups

ii Failure to meet delivery commitments and consequent loss of customers to other competitors.

An effective inventory management should:

i.   Ensure a continuous supply of raw materials to facilitate uninterrupted production

ii.   Maintain sufficient stock of raw materials in periods short supply and anticipate price changes

iii.   Maintain sufficient finished goods inventory for smooth sales operations and efficient customer service.

iv.   Minimize the carrying costs and time

v.   Control investment in inventories and keep it at an optimum level.

Inventory Management Techniques

The company's objective in managing inventory should be in consonant with the shareholder wealth maximization principle. Companies attempt to control basis by balancing the costs of stock shortages against those of stock building.

i   We can use the economic order quantity (EOQ) model to decide the optimum order size for inventory which will minimize the costs of ordering inventory plus stockholding costs.

ii   If discounts for bulk purchases are available, it may be cheaper to buy inventory in large order sizes so as to obtain the discounts.

iii   Uncertainty in the demand for inventory/or the supply lead time. In this case, a company may decide to hold buffer inventory (including its working capital investment) in order to reduce or eliminate the probability of "stock-outs".

Inventory Costs

There are four types of cost that are incurred anytime materials are procured and stored in the warehouse:

i   Purchase cost
ii Carrying cost
iii Ordering cost
iv Stock-out cost.

Purchase/Ordering Cost

Ordering costs relate to procurement of raw materials and include:

i   Requisitioning
ii   Purchase ordering
iii Transporting
iv Receiving
v   Inspecting and storing

Carrying Cost

This comprises the entire amount incurred to take care of the materials after they have been purchased and stored in the warehouse.

i   Cost of capital tied down on materials in the warehouse
ii   Cost of pilferage, breakages, deterioration, and others.
iii Rent
iv Cost of handling
v   Insurance

Stock-Out Cost

This is the amount incurred for carrying an inadequate number of materials in store at any point in time.

i   Lost sales
ii Loss of goodwill
iii Payment of wages to idle workers

Summary of Ordering Costs and Carrying Costs

Ordering Costs	**Carrying Costs**
i Requisitioning	Warehousing
ii Order Placing	Handling
iii Transportation	Clerical & Staff
iv Receiving, Inspecting & Storing	Insurance
v Clerical and Staff	Deterioration and Obsolescence

Deterministic Model: The Basic EOQ Formula Objectives of Economic Order Quantity (EOQ)

Two main objectives:

i   To determine the quantity that should be purchased anytime a fresh order is made

ii   To reduce to the barest minimum all lists that are associated with replenishment.

Assumptions of Economic Order Quantity (EOQ)

Fundamental assumptions of economic order quantity are:

i   Purchase price is constant – there is no discount

ii   Annual demand is known with certainty and it is uniformly consumed throughout the whole year

iii   The lead time is zero

iv   There is an instantaneous buildup of inventory.

Relevant Costs

Because of assumption (i) above, the purchase cost is irrelevant and because of assumption (iii) and (iv) there can never be stock-out cost. Consequently, the relevant costs are:

i   Ordering cost
ii Carrying cost

Derivation of EOQ Formula

Total Relevant Cost   =   Total carrying cost + Total ordering cost

TRC   =   TCC + TOC

=   average stock   no. of orders

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$$\begin{array}{ccc} & \overset{x}{\text{Carrying cost per}} & + & \overset{x}{\text{ordering cost per}} \\ & \text{Unit per year (C)} & & \text{unit (O)} \\ = & Qc & + & Do \\ & \dfrac{}{2} & & \dfrac{}{Q} \end{array}$$

Where: Q = Quantity ordered or EOQ

D = Annual Demand

O - Ordering Cost

C - Carrying Cost

EOQ is at the point where TCC is equal to TOC

$$Q2c \quad - \quad 2Do$$

$$Q2 \quad - \quad \dfrac{2Do}{C}$$

$$Q \quad - \quad \dfrac{2Do}{C}$$

OR

Economic order quantity = $\dfrac{2 \times \text{quantity required} \times \text{ordering cost}}{\text{Carrying cost}}$

We can go further to obtain the number of working days after which an order must be placed. The total number of orders to be placed in the year is given as:

Assume annual consumption of N20,000 and Economic Order quantity of 3,162.3 units.

Number of orders   =   Total annual consumption
In the year   EOQ

                                   =   20,000
                                                 3,162.3
                                   =   6.3

If we assume a 5-day working week and a fifty-week working year, it will translate to 250 working days (that is 5 x 50). Therefore the number of working days after which an order should be placed is:

No. of working days   Total working days per year
for placing orders   =   Number of orders per year
                                  =   250
                                             6.3
                                  =   39.6 days

The point at which an order is to be placed can be determined if the lead time is known with some degree of certainty. An order is to be placed every 39.6 days as calculated above. If we

assume a lead time of 10 days, then the number of days after the last delivery for which an order should be made will be obtained as follows:

Number of days after last delivery	=	Number of days order must be placed	Lead time
	=	39.6 -	10 days
	=	29.6	
	=	Ω 30 days	

Thus every thirty days after the last order was delivered, a fresh order will be made.

A critical assumption of the inventory model is that inventory usage will be at a steady rate. But in practice, usage could vary from one season to another. In a season when inventory usage is very high, there will be danger of stock out with its attendant production stoppages, sale loss and perhaps permanent loss of business, if adequate provision is not made. Another assumption of the model is that the lead time will be constant. Here again, in reality, lead time could vary as a result of unforeseen circumstances at the supplier's side.

Just-In-Time (JIT) Procurement

Just-In-Time (JIT) Manufacturing, also known as **Just-In-Time Production** or the Toyota Production System (TPS) is a methodology aimed primarily at reducing flow times within production system as well as response times from suppliers and to customers. Following its origin and development in Japan, largely in the 1960s and 1970s and particularly at Toyota

Just-in-Time procurement and stockless production are terms which describe a policy of obtaining goods from suppliers at the latest possible time (when they are needed) and so avoiding the need to carry any materials or component stock.

The introduction of JIT might bring the following benefits:

i Reduction in stock holding costs
ii Reduced manufacturing lead times
iii Improved labour productivity
iv Reduced scrap/rework/warranty cost
v Price reductions on purchased materials
vi Reduction in the number of accounting transactions

Reduced inventory levels mean that a lower level of investment in working capital will be required.

JIT will not be appropriate in some cases e.g. a restaurant might find it preferable to use the traditional economic order quantity as the method for staple non-perishable food stocks but adopt JIT for perishable and 'exotic' items.

10.08 Overtrading

According to Kurfi (2003), overtrading happens when a business tries to do too much too quickly with too little long-term capital, so that it is trying to support too large a volume of trade with the capital resources at its disposal. Such an overtrading company can operate at a profit, it could easily run into serious trouble because it is short of money, and these liquidity troubles stem from the fact that it does not have enough capital to provide the cash to pay its debts as they fall due.

Symptoms of Overtrading include-

1. A rapid increase in sales turnover
2. A rapid increase in the volume of current assets and possibly also fixed assets. Inventory turnover and debtors turnover periods might slow down which means that the rate of increase in inventory and debtors would be even greater than the rate of increase in sales turnover.
3. Only a small increase in proprietors' capital (e.g. retained payments, if any). Most of the increase in assets is financed by credit, especially:
   a. Trade creditors. The payment period to creditors is likely to become slower
   b. A bank overdraft, which often reaches or even exceeds the limit of the facilities agreed by the bank.
4. Some debt ratios and liquidity ratios aid change dramatically.
   a. The proportion of total assets financed by proprietors capital will decline, and the proportion financed by credit will rise
   b. The current ratio and the quick ratio will become much lower,
   c. The ratio of working capital to sales will decline
   d. Eventually, a business might have a liquid deficit i.e. an excess of current liabilities over current assets.
5. Eventually, if the business begins to press its debtors for quicker payment, the ratio of debtors to inventory might fall, without any decrease in bank overdraft.
6. Overhead costs might increase substantially so that net profit margins fall.
7. The gross profit ratio might fall because of higher purchase costs, discounts on some selling prices, and selling of some low moving inventory at low prices.

Causes of Overtrading

a. Overtrading is brought upon the business by the ambition of management.
b. The repayment of loans: A company may repay a loan without replacing it, in which case it has less long-term capital to finance its current level of operations.
c. Inflation: Business might be profitable, but in a period of inflation, its retained profits might be insufficient to provide finance to pay for the replacement of fixed assets and inventory, which now cost more because of inflation. The business will then rely increasingly on credit and find itself eventually enable to support its current volume of trading with a capital base that has fallen in 'real' value over time.

Remedies to Overtrading

As earlier mentioned in this write-up, overtrading is caused by ambitious management. Its solutions too must be provided by the management. However, some of the following measures will assist in solving the problem of overtrading.

a. Look for even longer credit or different source of credit or ask for extended overdraft facilities.
b. Press debtors for earlier payment. Better debtors control by reducing credit periods may well be a good thing, neither but nor too hard as it may result to loss of goodwill and lost sales.
c. Shareholders to inject new capital
d. Apply better control to stocks and debtors
e. Abandon ambitious plans for more expansion, more sales and more fixed assets acquisition etc. until the business has had time to consolidate its position and build up its capital base with more retained profits.

Total Quality Management

It is an American concept but has its profound application in Japan. TQM focuses on the belief that "total quality is essential to survival in a global market". TQM has the theme "Get it right first time every time". This implies that wastages are eliminated.

The basic principle of TQM is that the cost of preventing mistakes is less than the cost of correcting them once they occur plus the cost of lost potential for future sales. The total quality management as a concept aims for zero rejects and 100% quality.

The two approaches to controlling quality and quality costs are:

i   Approach A: minimize total quality costs by budgeting for a level of quality which minimizes preparation costs plus inspection costs on the one hand, and internal and external failure costs on the other.
ii   Approach B: aim for zero rejects and 100% quality. The desired standard of production is contained within the product specification and every limit produced ought to achieve this standard, that is, there out to be no defects. It should be noted that zero defect targets are one aspect of Japanese management philosophy.

Management of Debtors

Trade credit arises when a company sells its products or services on credit and does not receive cash immediately. Trade credit creates accounts receivable or trade debtors or simply debtors. A credit sale has three characteristics:

i   Involves an element of risk that should be carefully analysed
ii   It is based on economic value
iii   It implies futurity. The debtor will pay in a future period.

Debtors constitute a substantial portion of current assets of many companies in Nigeria today. Credit is based on trust.

In deciding a policy for the optimum level of total debtors,

a.　There is a tradeoff between
    i.　Extending credit so as to increase turn over and therefore profits, and on the other hand
    ii.　The interest and administrative cost of carrying debtors and the cost of bad debts
b.　Analysis of individual customers is instrumental in deciding the level of risk a company is prepared to take in extending credit
c.　Debt collection management also helps to establish the volume of debtors and bad credits.

Formulating a Policy for Credit Control

Several factors should be considered by management when a policy for credit control is formulated. These include:

a.　The administrative costs of debt collection
b.　The procedures for controlling credit to individual customers and also debt collection
c.　The amount of extra capital required to finance an extension of total credit.
d.　The cost of the additional finance required for any increase in the volume of debtors or the savings from a reduction in debtors.
e.　Any savings or additional expenses in operating the credit policy e.g. the extra chasing of slow payers.
f.　The ways in which credit policy can be implemented:
    i.　Credit can be eased by giving debtors a longer period in which to settle their account. The cost of credit would be the resulting increase in debtors.
    ii.　A discount can be offered for early payment. The cost of the credit policy would then be the cost of the discounts
g.　The effect of easing credit might be to:
    i.　Encourage a higher proportion of bad debts
    ii.　Increase in sales volume. Provided that the extra gross contribution from the increase in sales exceeds the increase in fixed costs expenses, bad debts, discount and the finance cost of an increase in working capital, a policy to relax terms would be profitable.

Debt Collecting Policy

The overall debt collection policy of the firm should be that the administrative costs and other costs incurred in debt collection should not exceed the benefits received from incurring those debts.

Extra spending on debt collection procedures might:

i   Reduce bad debt losses
ii   Reduce the average collection period and therefore the cost of the investment in debtors.

There is a limit which additional expenditure on debt collection would not have a sufficiently great effect on reducing losses or on the average collection period to justify the extra administrative costs.

Assessing Credit Worthiness

Credit control involves the preliminary investigation of potential credit customers and the continuing control of outstanding accounts. The points to note are:

a. New customers should give two good references, including one from a bank before being granted credit term
b. Credit rating might me checked through trade sources such as the local Chamber of Commerce
c. A new customer's credit limit should be fixed at a low level and only increased if his payment records warrant it.
d. For large value customers, a file should be maintained of any available financial information about the customer. The file should be reviewed regularly.
e. Used list of debtors should be produced and reviewed by a senior officer at regular intervals.
f. The credit limit for existing customers should periodically receive by a senior, but should only be raised at the request of the customer and if his credit standing is good.
g.   Press comment may give information about what a company is currently doing.
h. The company could send a staff to visit the debtor customer to get a first-hand impression of the debtor company.
i. Procedures should be put in place to ensure that further orders are not accepted from nor goods sent to a customer who is in difficulties. Always review the accounts of problematic customers by regular visits to them.
j. Character. Refers to the customer's willingness to pay. The moral factor is of considerable importance in credit evaluation in practice.
k. Capacity. Refers to the customer's ability to pay. Ability to pay can be judged by assessing the customer's capital and security offered. The credit manager should determine the real worth of assets offered as security.
l. Condition. This refers to the prevailing economic and other conditions which may affect the customer's ability to pay. Adverse economic conditions can affect the ability or willingness of a customer to pay.

The company may categorize its customers as follows:

i   Good Accounts: - financially strong customers

ii Bad Accounts: - financially very weak, high risk customer

iii Marginal Accounts: - these are customers with moderating financial health and risk i.e. between bad and good accounts.

10.09 Review Questions

1. Discuss the term, working capital.(5marks)
2. Evaluate why working capital management is important. (5marks)
3. Examine five major working capital policies of a typical Business Organization. (5marks)
4. Determine Economic Order Quantity (EOQ). (5marks)
5. Distinguish between EOQ and JIT in inventory management. (5marks)
6. Discuss the motives for holding cash in a business organization. (5marks)
7. Appraise the strategies for controlling cash disbursements. (5marks)
8. Assess why do businesses hold marketable securities? (5marks)
9. Analyse the 5 C's of credit. (5marks)
10. Evaluate the various methods of financing working capital. (5marks)
11. Miva Rice Ltd is considering a change of its credit policy which will result in a slowing down in the average collection period from one to two months. The relaxation in credit standards is expected to produce an increase in sales in each year amounting to 25% of the turnover/sales.

        Sales price per bag   ₦ 10,000
        Variable cost per bag   ₦ 8,500
        Current sales per annum   ₦ 24million

        The required rate of return on investment (ROI) is 20%

Assume that the 25% increase in sales would result in additional stocks of N100million and additional creditors of N20million, you are required to advise the company on whether or not to extend the credit period offered to customers, if:
a. All customers take the longer credit of 2months.
b. Existing customers do not change their payment habits, and only the new customers take a full 2months credit.(15marks)

12. BeulahTex Ltd has a sales level of ₦280million with a 10% net profit margin before interest and taxes. To generate this sales volume, the company maintains a fixed asset investment of ₦100million. At present, the company maintains ₦50million in current assets.
a. Determine the asset turnover for the company.
b. Compute the rate of return on assets.

c. Calculate the rate of return if management assumed a more conservative attitude and increased current assets by ₦50 million?

d. What would be the rate of return if management assumed a less conservative attitude and decreased current assets by ₦25million?

c. Appraise the significance of increase and decrease in current assets by ₦25million.
d. Assess the significance of the increase and decrease in the level of current assets.(15marks)

13. Ebe Joe Enterprises is a major distributor of Bongo Beer. The firm's annual sales has always averages 50,000 cartons. Each carton cost only N2,000 because the firm enjoys special distributorship status. Any time an administrative cost of N5,000. The carrying cost of the beer is 20 percent of the cost of each carton. Determine the most economical quantity to order.(10marks)

14. As a result of the introduction of Master's Degree programmes in the Faculty of Business Administration, the University Bookshop is experiencing very high demand for Financial and Investment Analysis by Dr. U.C. Nzewi. The Bookshop manager projects that he will sell 1200 copies of the book in the year. Unfortunately, the rent for the packing store of the Bookshop suddenly increased so much that the carrying cost of the book increased to N12per copy. At the same true, the order cost of the book remains steady at N11 per order.

a. What is the marginal carrying cost (for a unit increase in order size)?
b. How many orders should the Bookshop place in the year?
c. At what inventory level does the marginal carrying cost equal the marginal reduction in order cost?
d. What is the average inventory?(15marks)

15. By selling on credit, the firm would seem to be giving free credit to its customers. What should firms do so? Should the firm not be better-off if all sales are on cash basis and late payers are charged interest? (5marks)

16. Emma Biu Trading Company Ltd has its head office located in Sokoto. A great majority of its customers are in the southeastern States of Nigeria, particularly in Umuahia. To speed up the collection of cheques from the customers in Umuahia zone, it opened a lockbox system, and contracted ABL Bank Plc Umuahia Branch to administer it. The system has been in use for one year and the following facts are available:
a. Daily average number of cheques collected 600
b. Daily average amount of each cheque collected N4,800
c. Rate of interest per day 0.04%
d. Savings in mail time 1.6days
e. Savings in processing time 1.1days
ABL Bank charges N0.4 per cheque handled. You are required to calculate the benefit ~~from~~ of operating the lockbox system.

17. Samque Bookshop uses up cash at a steady rate of N2miilon a year. The interest rate is 5 percent and each time it replenishes cash by selling marketable securities, it incurs a fixed administrative cost of N200.
    a. Ascertain the marginal carrying cost of cash for each N1 increase in order size
    b. Determine the point at which the marginal carrying cost equals the marginal reduction in order cost.
    c. How many times should the firm sell securities in a year?
    d. What is the average cash balance in the year?

MODULE 11

11.00   **FINANCIAL MANAGEMENT OF SPECIFIC BUSINESS ENTITIES**

11.01 Learning Outcomes

On successful completion of this module, students should be able to:
    i   Discuss the roles of small/medium enterprises (SMEs) in the economic development of Nigeria
    ii Evaluate the various sources of finance available to SMEs
    iii Identify the obstacles to SMEs financing
    iv Analyse the relationship between pension reform act and SME financing
    v Appraise the concept of ventures in SMEs
    vi Examine Key factors to be considered by a venture capital firm while making investment
    vii Evaluate gearing (financial leverage) in SMEs

11.02 Issues Relating to Finance of Small and Medium Scale Enterprises

The definition or classification of small and medium enterprises (SMEs) differs from country to country as there is no generally accepted definition or classification. Authors, scholars, and schools have offered various definitions as to the concept with differences in terms of capital outlay, number of employees, sales turnover, fixed capital investment, available plant and machinery, market share and the level of development.

In western countries such as the United States of America, Great Britain, Germany, and other European countries, small and medium scale enterprises (SMEs) are defined in terms of turnover and number of employees. As a result of the definitional differences of SMEs across countries and the absence of a universal definition, the European Union in 2003 adopted a universally accepted definition of small and medium scale enterprises and micro business as companies with less than 250 employees, and for which revenues must not exceed 50million euro (turnover) or 43million euro.

The performance and development of SMEs have throughout the world, been of great interest to, among others, development economists, entrepreneurs, governments, venture capital firms, financial institutions and non-governmental organizations. Development theorists regard SMEs as the seed-bed for the development of large companies and the lifeblood of commerce and industry at large. Thus, SMEs are being hailed globally for their pivotal role in promoting grassroots economic growth and equitable sustainable development.

The development literature focuses a good deal of attention on issues faced by SMEs and major among these is in their access to finance. Traditionally, the focus is on obstacles created by commercial banks or equity funds, or on imperfections in the broader institutional environment. However, SMEs also make decisions about financing and display attitudes that have an important bearing on financing decisions. Therefore, constraints may also appear on the 'demand side' of the financing marketplace.

11.03   Sources of Finance for SMEs

Often the hardest part of starting a business is raising the money to get going. The entrepreneur might have a great idea and a clear idea of how to turn it into a successful business. However, if sufficient finance can't be raised, it is unlikely that the business will get off the ground.

Raising finance for start-up requires careful planning. The entrepreneur needs to decide:

       i   How much finance is required?
      ii   When and how long the finance is needed for?
     iii What security (if any) can be provided?
     iv Whether the entrepreneur is prepared to give up some control (ownership) of the start-up in return for an investment.

The finance needs of a start-up should take account of these key areas:

       i   Set-up costs (the costs that are incurred before the business starts to trade)
      ii   Starting investment in capacity (the fixed assets that the business needs before it can begin to trade)
     iii Working capital (the stocks needed by the business –e.g. raw materials + allowance for amounts that will be owed by customers once sales begin)
     iv Growth and development (e.g. extra investment in capacity)

One way of categorising the sources of finance for a start-up is to divide them into sources which are from within the business (internal) and from outside providers (external).

Internal Sources

The main internal sources of finance for a start-up are as follows:

Personal sources these are the most important sources of finance for a start-up, and we deal with them in more detail in a later section.

Retained profits this is the cash that is generated by the business when it trades profitably – another important source of finance for any business, large or small. **Note that retained profits can generate cash the moment trading has begun.** For example, a start-up sells the first batch of stock for N5, 000 cash which it had bought for N2, 000. That means that retained profits are N3, 000 which can be used to finance further expansion or to pay for other trading costs and expenses.

Share capital – invested by the founder: The founding entrepreneur (/s) may decide to invest in the share capital of a company, founded for the purpose of forming the start-up. This is a common method of financing a start-up. The founder provides all the share capital of the company, retaining 100% control over the business.

The advantages of investing in share capital are covered in the section on business structure. The key point to note here is that the entrepreneur may be using a variety of personal sources to invest in the shares. Once the investment has been made, it is the company that owns the money provided. The shareholder obtains a return on this investment through **dividends** (payments out of profits) and/or the value of the business when it is eventually sold.

A start-up company can also raise finance by selling shares to **external investors** – this is covered further below.

External Sources

Loan capital this can take several forms, but the most common are **bank loan** or **bank overdraft**.

A bank loan provides a **longer-term** kind of finance for a start-up, with the bank stating the fixed period over which the loan is provided (e.g. 5 years), the rate of interest and the timing and amount of repayments. The bank will usually require that the start-up provide some security for the loan, although this security normally comes in the form of personal guarantees provided by the entrepreneur. Bank loans are good for financing investment in fixed assets and are generally at a lower rate of interest that a bank overdraft. However, they don't provide much flexibility.

A bank overdraft is a more short-term kind of finance which is also widely used by start-ups and small businesses. An overdraft is really a loan facility – the bank lets the business "owe it money" when the bank balance goes below zero, in return for charging a high rate of interest. As a result, an overdraft is a flexible source of finance, in the sense that it is only used when needed. Bank overdrafts are excellent for helping a business handle seasonal fluctuations in cash flow or when the business runs into short-term cash flow problems (e.g. a major customer fails to pay on time). Two further loan-related sources of finance are worth knowing about:

Share capital – outside investors for a start-up, the main source of outside (external) investor in the share capital of a company is **friends and family** of the entrepreneur. Opinions differ on whether friends and family should be encouraged to invest in a start-up company. They may be prepared to invest substantial amounts for a longer period of time; they may not want to get too involved in the day-to-day operation of the business. Both of these are positives for the entrepreneur. However, there are pitfalls. Almost inevitably, tensions develop with family and friends as fellow shareholders.

Business angels are the other main kind of external investor in a start-up company. Business angels are professional investors who typically invest £10k - £750k. They prefer to invest in businesses with high growth prospects. Angels tend to have made their money by setting up and selling their own business – in other words, they have proven entrepreneurial expertise. In addition to their money, Angels often make their own skills, experience and contacts available to the company. Getting the backing of an Angel can be a significant advantage to a start-up, although the entrepreneur needs to accept a loss of control over the business.

You will also see **Venture Capital** mentioned as a source of finance for start-ups. You need to be careful here. Venture capital is a specific kind of share investment that is made by **funds managed by professional investors.** Venture capitalists rarely invest in genuine start-ups or small businesses (their minimum investment is usually over £1m, often much more). They prefer to invest in businesses which have established themselves. Another term you may hear is "private equity" – this is just another term for venture capital.

A start-up is much more likely to receive investment from a business angel than a venture capitalist.

Personal sources

As mentioned earlier, most start-ups make use of the personal financial arrangements of the founder. This can be personal savings or other cash balances that have been accumulated. It can be personal debt facilities which are made available to the business. It can also simply be the found working for nothing! The following notes explain these in a little more detail.

Savings and other "nest-eggs" An entrepreneur will often invest personal cash balances into a start-up. This is a cheap form of finance and it is readily available. Often the decision to start a business is prompted by a change in the personal circumstances of the entrepreneur – e.g. redundancy or an inheritance. Investing personal savings maximises the control the entrepreneur keeps over the business. It is also a strong signal of commitment to outside investors or providers of finance. Re-mortgaging is the most popular way of raising loan-related capital for a start-up. The way this works is simple. The entrepreneur takes out a second or larger mortgage on a private property and then invests some or all of this money into the business. The use of mortgaging like this provides access to relatively low-cost finance, although the risk is that, if the business fails, then the property will be lost too.

Borrowing from friends and family this is also common. Friends and family who are supportive of the business idea provide money either directly to the entrepreneur or into the business. This can be quicker and cheaper to arrange (certainly compared with a standard bank loan) and the interest and repayment terms may be more flexible than a bank loan. However, borrowing in this way can add to the stress faced by an entrepreneur, particularly if the business gets into difficulties.

Credit cards this is a surprisingly popular way of financing a start-up. In fact, the use of credit cards is the most common source of finance amongst small businesses. It works like this. Each month, the entrepreneur pays for various business-related expenses on a credit card. 15 days later the credit card statement is sent in the post and the balance is paid by the business within the credit-free period. The effect is that the business gets access to a free credit period of around 30-45 days.

11.04   Concept of SME Financing in Nigeria 384

In Nigeria, an empirical report shows that an estimate of about 70% of the industrial employment is held by SMEs and more than 50% of the Gross Domestic Product is SMEs generated (Odeyemi, 2003).

Given the seminal role of SMEs to the economy of Nigeria, various regimes of government since independence in the 1960s, have focused on various programmes and spent immense amount of money with the primary goal of developing this sector, these have however not yielded any significant results as evident in the present state of the SMEs in the country (Mambula, 1997). SMEs are generally very susceptible and only a certain number of them manage to survive due to several factors such as difficulty in accessing credits from banks and other financial institutions; harsh economic conditions which result from unstable government policies; gross undercapitalisation, inadequacies resulting from the highly dilapidated state of Infrastructural facilities; astronomically high operating costs; lack of transparency and corruption; and the lack of interest and lasting support for the SMEs sector by government authorities, to mention a few.

The situation is equally prevalent in the Nigerian economy where commercial banks often prefer to lend to the government, trade in foreign exchange (FOREX), and financing buying and selling. A banker in Nigeria aptly put such preferences that "the banks are not a charity, hence why should they take risks with SMEs when they can make good money elsewhere".
These preferences and tendencies of the commercial banks have worsened the lack of
Financing for SMEs which has also affected the economic growth. The Financial systems in every country play a key role in the development and growth of the economy, although the ability to play this role effectively and efficiently largely depends on the degree of development of the financial system. The traditional commercial banks which are key players in the financial systems of nearly every economy have the potential to pull financial resources together to meet the credit needs of SMEs, however, there is still a huge gap between supply capabilities of the banks and the demanding needs of SMEs. In Nigeria, the situation is even more prevalent as noted by Olutunla and Obamuyi (2008).

SMEs in Nigeria have not performed creditably well and hence have not played the expected vital and vibrant role in the economic growth and development of Nigeria.
However, the role played by SMEs, notwithstanding their development, is everywhere constrained by inadequate funding and poor management. The unfavourable macroeconomic environment has also been identified as one of the major constraints which most times encourage financial institutions to be risk - averse in funding small and medium scale businesses

Financial systems, the world over, play fundamental roles in the development and growth of the economy. The effectiveness and efficiency in performing these roles, particularly the intermediation between the surplus and deficit units of the economy, depends largely on the level of development of the financial system. It is to ensure its soundness that the financial sector certainly the most regulated and controlled by the government and its agencies.
SMEs play very important roles in developing economies, and assisting them is a task which ranks high in the priorities of the governments. This position is corroborated by other studies which identified financial support as one of the main factors responsible for small business failures in Nigeria

11.05 Methods of Venture Capital Financing

It is a private or institutional investment made into early-stage / start-up companies (new ventures). As defined, ventures involve risk (having uncertain outcome) in the expectation of a sizeable gain. Venture Capital is money invested in businesses that are small; or exist only as an initiative but have huge potential to grow. The people who invest this money are called venture capitalists (VCs). The venture capital investment is made when a venture capitalist buys shares of such a company and becomes a financial partner in the business.

Venture Capital investment is also referred to risk capital or patient risk capital, as it includes the risk of losing the money if the venture doesn't succeed and takes medium to long-term period for the investments to fructify.

Venture Capital typically comes from institutional investors and high net worth individuals and is pooled together by dedicated investment firms.

It is the money provided by an outside investor to finance a new, growing, or troubled business. The venture capitalist provides the funding knowing that there's a significant risk associated with the company's future profits and cash flow. Capital is invested in exchange for an equity stake in the business rather than given as a loan.

Venture Capital is the most suitable option for funding a costly capital source for companies and most for businesses having large up-front capital requirements which have no other cheap alternatives. **Software and other intellectual property** are generally the most common cases whose value is unproven. That is why; Venture capital funding is most widespread in the fast-growing technology and biotechnology fields.

Features of Venture Capital investments

    i   High Risk
    ii   Lack of Liquidity
    iii Long-term horizon
    iv Equity participation and capital gains
    v   Venture capital investments are made in innovative projects
    vi Suppliers of venture capital participate in the management of the company

Methods of Venture capital financing

    i   Equity
    ii   participating debentures
    iii conditional loan

THE FUNDING PROCESS: Approaching a Venture Capital for funding as a Company

The venture capital funding process typically involves four phases in the company's development:

    i   Idea generation
    ii   Start-up
    iii Ramp-up
    iv Exit

Step 1: Idea Generation and Submission of the Business Plan

The initial step in approaching a Venture Capital is to submit a business plan. The plan should include the below points:

    i   There should be an executive summary of the business proposal
    ii   Description of the opportunity and the market potential and size
    iii Review of the existing and expected competitive scenario

    iv   Detailed financial projections

    v   Details of the management of the company

There is a detailed analysis done of the submitted plan, by the Venture Capital to decide whether to take up the project or no.

Step 2: Introductory Meeting

Once the preliminary study is done by the VC and they find the project as per their preferences, there is a one-to-one meeting that is called for discussing the project in detail. After the meeting, the VC finally decides whether or not to move forward to the due diligence stage of the process.

Step 3: Due Diligence

The due diligence phase varies depending on the nature of the business proposal. This process involves solving queries related to customer references, product and business strategy evaluations, management interviews, and other such exchanges of information during this time period.

Step 4: Term Sheets and Funding

If the due diligence phase is satisfactory, the VC offers a term sheet, which is a non-binding document explaining the basic terms and conditions of the investment agreement. The term sheet is generally negotiable and must be agreed upon by all parties, after which on completion of legal documents and legal due diligence, funds are made available.

Types of Venture Capital funding

The various types of venture capital are classified as per their applications at various stages of a business. The three principal types of venture capital are early-stage financing, expansion financing, and acquisition/buyout financing.

The venture capital funding procedure gets complete in six stages of financing corresponding to the periods of a company's development.

    i   Seed money: Low-level financing for proving and fructifying a new idea.

    ii   Start-up: New firms needing funds for expenses related to marketing and product development.

    iii First-Round: Manufacturing and early sales funding.

    iv Second-Round: Operational capital given for early-stage companies which are selling products, but not returning a profit.

    v   Third-Round: Also known as Mezzanine financing, this is the money for expanding a newly beneficial company.

    vi Fourth-Round: Also called bridge financing, 4th round is proposed for financing the "going public" process.

A) Early Stage Financing:

Early stage financing has three subdivisions seed financing, start-up financing and first stage financing.

  i Seed financing is defined as a small amount that an entrepreneur receives for the purpose of being eligible for a startup loan.

  ii Start-up financing is given to companies for the purpose of finishing the development of products and services.

  iii First Stage financing: Companies that have spent all their starting capital and need finance for beginning business activities at the full-scale are the major beneficiaries of the First Stage Financing.

B. Expansion Financing:

Expansion financing may be categorized into second-stage financing, bridge financing, and third stage financing or mezzanine financing.

Second-stage financing is provided to companies for the purpose of beginning their expansion. It is also known as mezzanine financing. It is provided for the purpose of assisting a particular company to expand in a major way. Bridge financing may be provided as a short-term interest only finance option as well as a form of monetary assistance to companies that employ the Initial Public Offers as a major business strategy.

C. Acquisition or Buyout Financing:

Acquisition or buyout financing is categorized into acquisition finance and management or leveraged buyout financing. Acquisition financing assists a company to acquire certain parts or an entire company. Management or leveraged buyout financing helps a particular management group to obtain a particular product of another company.

11.06 Venture Capital as a Source of Finance
Venture capital is equity financing provided by institutional investors that either manages a fund on behalf of large institutions (usually pension funds and insurance companies) or have their own proprietary pool of capital. Venture capital is raised in a series of stages or rounds. Venture capital investors usually specialize in one specific investment stage. Each stage also has its own unique set of parameters with respect to the:
  a. The operational progress that a potential investor needs to demonstrate
  b. Amount of capital a fund might invest in a given venture
  c. Investment time horizon (i.e., how long before the investor expects to get its/his money back)
  d. Investor return expectations (i.e., how much of the company will the investor expect to satisfy their return requirements).

Characteristics of Venture Capitalists

Venture capitalists generally:

   a. Finance new and rapidly growing companies.
   b. Purchase equity securities.
   c. Assist in the development of new products or services.
   d. Add value to the company through active participation.
   e. Take higher risks with the expectation of higher rewards.
   f. Have a long-term orientation.

Advantages of Venture Capital Finance

a. It injects long-term equity finance which provides a solid capital base for future growth.

b. The venture capitalist is a business partner, sharing both the risks and rewards. Venture capitalists are rewarded by business success and the capital gain.

c. The venture capitalist is able to provide practical advice and assistance to the company based on past experience with other companies which were in similar situations.

d. The venture capitalist also has a network of contacts in many areas that can add value to the company, such as in recruiting key personnel, providing contacts in international markets, introductions to strategic partners, and if needed co-investments with other venture capital firms when additional rounds of financing are required.

e. The venture capitalist may be capable of providing additional rounds of funding should it be required to finance growth.

Disadvantages of Venture Capital Finance

a. The agreement of funding is passed on a contract which could be partial ownership or other profit-sharing schemes. If this is not properly negotiated by the entrepreneur, he might lose ownership of his whole business or idea and future to them.

b. Intrusion and control: the Venture Capitalist gets the right to drive the firm and, thereby, can take a strategic decision or additional loans and income notes.

11.07   Review Questions

1.   What is capital venture finance and what are its advantages and disadvantages?(5marks)

2.   Distinguish between early-stage financing and expansion financing, explaining the stage at which each is necessary. (5marks)

3.   Methods of Venture capital financing include:

  i   Equity
  ii   participating debentures
  iii conditional loan

       Explain each, using relevant examples.(15marks)

4.   Evaluate the roles played by small, medium and large-scale enterprises in the development of Nigeria's economy.(5marks)

5.   A start-up company has various options as means of start-up capital. Explain at least 5 of such sources, highlighting the advantages and disadvantages of each over the others.(5marks)

MODULE 12
12.00 INTERNATIONAL FINANCE

12.01 Learning Outcomes
On successful completion of this module, students should be able to:
i. Discuss the importance of foreign trade among nations.

ii. Assess ways of maintaining favorable balance of trade.
iii. Calculate exchange rates between currencies of the world.
iv. Evaluate and select a prudent source of finance in the international market.
v. Analyse the functions of financial intermediation.

12.02 International Financial Market
In daily life, we find ourselves in constant contact with internationally traded goods- cars, furniture, TV programmes, clothes, computers, even food items, etc. - goods and services cars manufactured in almost all the continents of the world may be competing in the same local street.

Less visible in daily life is the international trade in financial assets, but its dollar volume is much greater. This trade takes place in the international financial markets. When international trade in financial assets is easy and reliable due to low transactions costs in liquid markets, it is said that international financial markets are characterized by high capital mobility.

Financial capital was highly mobile in the nineteenth century. The early twentieth century brought two world wars and the Great Depression. Many governments implemented controls on international capital flows, which fragmented the international financial markets and reduced capital mobility. Postwar efforts to increase the stability and integration of markets for goods and services included the creation of the General Agreement on Tariffs and Trade (the GATT, the precursor to the World Trade Organization, or WTO). Until recently, no equivalent efforts addressed international trade in securities. The low level of capital mobility is reflected in the economic models of the 1950s and 1960s: economists felt comfortable conducting international analyses under the assumption of capital immobility.

The International Financial Market is the place where financial wealth is traded between individuals (and between countries). It can be seen as a wide set of rules and institutions where assets are traded between agents in surplus and agents in deficit and where institutions lay down the rules.

The financial market comprises the markets (i.e. stock market, bond market, currency market, derivatives market, commodity market and money market), the institutions which work in them with different aims and functions, as well as direct/indirect policies orientated to making the market the place (not necessarily a physical place and not necessarily ruled but regulated) where the exchange between surplus and deficit units is carried out as efficiently as possible.

With regard to policies, consideration must be given to those connected with monetary, fiscal and more structural policies, as well as those directly connected with the governance of the market itself.

Governance in the financial market can be defined as a set of rules useful in interconnecting the agents who operate within it and the institutions. These rules define the market and can be defined at both a microeconomic and macroeconomic level.

Microeconomic rules deal not only with individuals (single money savers, professional agents, and companies) but also with the market itself and its microstructure. Macroeconomic governance rules deal with the market as a whole, but they are also strictly connected with policies regulating the market.

At a macroeconomic level, governance is important for the financial market in order to define every single rule of the trading process: from those which regulate the stock exchange or the Over the Counter (OTC) trades to those which define who can join the market. Moreover, great importance is given to the market microstructure, where the microstructure is understood as the set of rules that makes and defines the asset exchange price. This is the main point in allowing the market to function properly. The liquidity/thickness/depth of the market depends on the price formation rules according to which the asset is traded off.

At a microeconomic level, the steps to trade assets on the financial market are: listing, trading, and post-trading. The latter comprises clearing, settlement, and custody. From the market insiders' point of view, each of these steps needs to be defined in order to conclude the exchange at a time and price previously defined. Each step has its own rules that allow those who operate in the financial market to establish their own strategy with respect to their specific expectations. The traded asset returns are linked to the definition of these rules. Each market has its own rules that deal with the microstructure. Different markets have different liquidity and this depends on the micro-rules that they themselves have established. These rules are relevant both for (official) exchange trading and for the OTC trading.

Another class of microeconomic governance rules is those which state, for instance, who can operate in the market and how. Microeconomic rules also concern the manner in which the institutions themselves operate in the market.

Macroeconomic rules of the financial market have a different task and are linked to the broad-spectrum policies of the market. These can indicate the required market institution, the market structure and furthermore its aims and its own monetary and fiscal policies. All these characteristics make the market unique with respect to the economy in which it works. One of the features of this uniqueness is market transparency. This characteristic is defined on the basis of (governance) rules, institutions, agents, and policies connected to it. The more people know how to complete the trading asset process, the more a market is transparent. In this manner, expectations become heterogeneous for individuals/agents and, at the same time, they reflect the information at hand, which is then elaborated depending on the different sell/buy strategies.

This leads to the definition of expectations. Defining the role of expectations in a financial market has a two-fold purpose. The first is defined at a macroeconomic level. Expectations are defined with respect to the policies and rules to be adopted in the market. This leads to defining the sell/buy strategies on the basis of the role that, for instance, inflation will have in the subsequent period t+1 given the policies/rules defined in t. This kind of expectation may vary depending on the discretion that exists in defining the rules, not only at

a macroeconomic level but also at a microeconomic one. The second objective is microeconomic. Agents formulate their expectations to predict asset price variations in order to determine the asset returns. This point leads back to the liquidity concept previously introduced. The different level of liquidity in the trading process determines a different formulation of expectations. In the same way, the diverse discretion utilised in setting macroeconomic rules determines a different formulation of the expected inflation.

Macroeconomic rules, as previously defined, are connected to different monetary and fiscal policies. The financial market is subjected to policies that depend mostly on the regulating institutions. At the same time, institutions are responsible for defining rules and for enforcing the application of these rules in the market. The institutions determine the rules that in turn define their field of action.

Individuals who operate in one market have to follow these rules but, at the same time, their decision is based on the rules that a given market has set itself. Transparency, liquidity, and expectations help individuals to choose the market in order to maximise their own utility.

The financial market examined in this manner is an extremely complex system in which rules, individuals, and institutions interact. This complexity increases even more in time and space (in the case of international financial markets). In time, financial markets cover an increasingly important role in the financial saving mediation of agents at an international as well as at a national level. In space, agents have instruments at their disposal that have become increasingly more complicated and specific. These instruments are utilised through the markets of reference (stock market, bond market, currency market, derivatives market, commodities market, money market) that are a fundamental part of the financial market. Each market has its own characteristics that in turn define the contexts in which agents operate on the basis of the risk associated to them.

Types of International Markets

i. **International debt markets**: Third countries wishing to raise large amounts of money can do this by issuing bonds that are repaid with interest at a fixed future date. Large institutional investors, such as pension funds, usually buy such bonds because they are seen as low-risk investments. When a country issues bonds in a foreign currency, they are known as sovereign bonds. Large private corporations can also issue "corporate bonds" in a foreign currency to fund their operations and investments. Such bonds are traded on "international debt markets". At the end of 2006, the share of euro-denominated debt in international debt markets was 31.4%, while the US dollar comprised 44.1%

ii. **International loan and deposit markets**: Banks make loans and accept deposits across the world in various currencies which form the international loan and deposit markets. These lending and borrowing involve countries and corporations worldwide, for example, a corporation borrowing to fund new investments in a developing country, or a government placing oil revenues on deposit with a bank until needed. The euro is playing an important role in these markets. In December 2006, euro-area bank lending

to non-bank institutions outside the euro area was denominated at 36.3% in euro and 44.8% in US dollars.

iii. **Foreign exchange markets**: Foreign exchange (forex) markets are those where currencies are traded for others. The euro has become the second most actively traded currency in forex markets. At the beginning of 2007, it was a counterpart in around 37% of the daily transactions, compared to a share of 86.5% for the US dollar, 16.5% for the Japanese yen and 15% for the pound sterling (both sides of transactions are counted so that shares add up to 200%).

iv. **International trade**: The euro is increasingly used by the euro-area Member States as the currency of settlement and invoicing in international trade. In the first quarter of 2006, in most euro-area countries where data was available the average share of the euro in euro-area exports of goods to countries outside the EU was around 50% "slightly surpassing the US dollar, which is used in around 44% of the transactions in terms of value" whereas in imports of goods the euro's share was around 35%. To a much smaller extent, the euro is beginning to be used as a "vehicle currency" for trade between third countries, although the US dollar is still dominant in this. As the euro area constitutes the largest trading block and one of the most open economies in the world, the use of the euro in international trade can be expected to grow in the future.

v. **Reserves and anchors**: As a major currency, the euro is used as an "anchor currency" by some third countries to manage their own exchange-rate regimes. For example, Russia uses the euro as part of a basket of currencies for the daily management of the double exchange rate. In addition, the euro is increasingly held as a reserve currency by third countries because they have confidence it will maintain its value. The share of the euro in global foreign exchange reserves is over 25% (mid 2007) and close to 29% in developing countries, which have increased their reserves significantly from 18% held in 1999. In comparison, the US dollar accounts for around 65% and the pound sterling for around 4.5% of global currency reserves.

Fundamental Factors that Drive an Exchange Rate

Interest rates- interest rates have a large effect in a world where financial capital can move freely between countries. When a country's interest rates are high relative to elsewhere this attracts inflows of money into a country seeking to take advantage of the high interest rates. This "interest differential" boosts the demand for the currency and can cause its value to rise.

Economic growth: Countries experiencing a deep recession often find that their exchange rate is weakening. Traders in the currency markets may take the slow growth to be a sign of general economic weakness and "markdown" the value of the currency as a result.

On the other hand, economies with strong "export-led" growth may see their currency's rise in value. Japan is a good example of this in recent years. The Euro was weak during the first six months of its existence in part because the financial markets were worried about the slow growth of the European economy and the persistently high level of unemployment.

Inflation: In the long run, those countries with higher than average inflation see their exchange rate falls. When inflation is high, a country becomes less competitive in international markets causing a fall in exports (a demand for a currency) and a rise in imports (a supply of currency overseas). A fall in the exchange rate may be needed to restore a country's competitiveness in overseas markets.

The balance of payments: Selling exports represents a demand for the domestic currency from foreign importers. When US consumers but British Whisky they supply dollars and this is eventually translated into a demand for pounds.

Similarly, when UK consumers buy imports, they supply their own currency and this is eventually translated into a demand for foreign currencies. If a country is running a substantial trade surplus there is a large demand for the currency and its value should appreciate. By contrast, a massive trade deficit usually causes the currency to lose value.

Market speculators: Special factors (such as political events, changing commodity prices etc.) can have an effect on a currency. In addition, the power of market speculators has grown. When speculators decide that a currency is going to fall in value, they sell that currency and buy ones they anticipate will rise in value.

It is difficult for governments to offset the power of speculators because their reserves of foreign currencies are very small compared to daily turnover in the market.

Globalisation and Security Markets: Over recent decades, there has been a steady increase in cross-border financial flows around the world. First, various financial institutions including banks and institutional investors have expanded their activities geographically. In this process, they acted as an intermediary to channel funds from lenders to borrowers across national borders. Second, the more mature securities markets have gained a clear cross-border orientation. In many instances, newly issued securities are designed and offered to the public in such a way as to maximise their appeal to international investors.

These developments reflected the progressive dismantling of controls on cross-border financial flows as well as the liberalisation of national financial markets more generally.

This resulted in an augmentation of the range of borrowing and lending possibilities available to economic agents throughout the world. In particular, there was a marked expansion of the range of financial possibilities available for financing current account deficits and recycling current account surpluses.

In the process of developing the globalisation of financial markets seen over recent decades, both technological advances and financial innovation played a key role. In the past few decades, information systems have become able to compute and store more data more rapidly. Telecommunications networks have extended their ramifications and augmented their capacity while more reliable data exchange protocols have made it possible to connect computing machines in more efficient ways. As a result, cross-border financial deals have become both easier and more secure, effectively lowering the barrier constituted by distance,

be it determined by geography or other factors. Moreover, particularly over the last two decades, financial markets have become breeding ground for a wide array of rapidly evolving financial products, often described generically as "derivative" instruments. These products make it possible for borrowers and lenders to customise their risk exposures as well as adjust them over time. With derivative products, borrowers and lenders can, therefore, mitigate some of the problems associated with asymmetries of information in financial markets, which are particularly acute in the international context.

However, the integration of financial markets across national borders is not a new phenomenon. In the period of the gold standard, from around the middle of the nineteenth century to 1914, financial markets had been well integrated at the global level although the architecture of the international financial system was very different from what it is now. Nevertheless, several of the issues envisaged by economic policymakers in the period preceding 1914 are astonishingly similar to those posed by the globalisation of financial markets in the present day. This includes issues such as the vulnerability of the international financial system to crises or the limited room for manoeuvre which is available for economic policy pursuing specific objectives at the national level.

12.03 Globalization and Financial Markets

Global markets are markets in which the law of one price applies, in the sense that it would be possible to buy or sell products for the same price irrespective of geographical location and local circumstances. When products are purchased and sold outside national boundaries, price differentials may remain as long as there are costs specifically associated with the cross-border exchange as opposed to exchange within national boundaries. Hence, the process of internationalisation of financial markets is only a step towards global financial markets. This distinction between globalisation and internationalisation seems to apply to financial markets as well as to markets for goods and non-financial services. Over recent decades, financial markets have gained a clear cross-border orientation but, overall, it can be argued that they are still not truly global.

What are the benefits and risks associated with the globalisation of financial markets, and what are the implications for monetary policy?

Benefits of globalization

A short description of the economic benefits associated with the globalisation of financial markets is proposed by Obstfeld (1994), who writes that, "in theory, […] individuals gain the opportunity to smooth consumption by borrowing or diversifying abroad, while world savings are directed to the world's most productive investment opportunities". A practical implication of the theory is that globally integrated financial markets provide more flexible ways of both financing current account deficits and recycling current account surpluses. Moreover, the free

play of market mechanisms should tend to ensure that both borrowers and lenders do not knowingly take excessive risks.

Additional benefits from the globalisation of financial markets include the more rapid spreading of technological advances, financial innovation as well as, more generally, financial performance to the various parts of the globe.

In a global financial market, technological advances in payment, settlement and trading systems as well as in financial information systems can be made available to all market participants instantaneously. For example, in the 1990s certain large financial institutions published, at no or limited cost, the new methods of calculation which they had developed for measuring their market risk exposures as well as, later, their credit risk exposures. This contributed to a relatively rapid spreading of the new risk measurement technologies amongst numerous financial institutions which needed to upgrade their risk assessment systems, including in particular financial institutions located in the euro area.

Another source of benefit from the globalisation of financial markets is the spreading of financial innovation. Irrespective of the location of their residence, financial market participants may, provided they can demonstrate sufficient creditworthiness, make use of new financial products as soon as these instruments start being marketed in the global financial marketplace.

More importantly, in open financial market the entry of foreign financial institutions into domestic financial markets can bring sizeable benefits, as increased competition can help to enhance efficiency in the financial sector. Berger, DeYoung, Genay and Udell (2000) provide an analysis of changes in efficiency in the financial sector following the entry of foreign financial institutions. They show that efficiency gains remain limited, which presumably reflects the difficulties associated with the acquisition of local financial information. However, they also show that US financial institutions seem to be able to cause gains in efficiency when they enter local financial markets, which seems to reflect the positive impact of increased competition and of the transfer of corporate expertise.

Risks

In the last three decades, while more progress was made in the internationalisation of financial markets, there have been numerous occurrences of financial crises. Some of these financial crises exerted disruptive and protracted effects on the economy, both locally and globally. As a result, economic policymakers together with market participants have devoted considerable attention to the issue of how best to avoid financial crises. In particular, in April 1999, a grouping called the Financial Stability Forum (FSF) was created with the objective of promoting international financial stability through information exchange and international co-operation in financial supervision and surveillance.

In economic terms, the risks to financial stability may be seen as mainly arising from market inefficiencies. As pointed out earlier, the home bias and Feldstein-Horioka puzzles would seem to suggest that inefficiencies remain sizeable in international financial markets, presumably

because of information asymmetries as well as transaction costs. In broad terms, these inefficiencies can manifest themselves in various ways, including externality and co-ordination problems. Externalities would seem to occur in particular with the setting up of market infrastructures such as payment and settlement systems. Co-ordination problems would seem to occur mainly in the form of principal- agent problems affecting the relationship between borrowers and lenders because of information asymmetries or information verification problems.

As a remedy against financial crises, some commentators have proposed to reinstate some restrictions on capital flows in certain specific cases. An example often cited in this regard is that of Chile, where short-term capital inflows were penalised between 1991 and 1998 through the imposition of minimum reserve requirements. Certain observers, considering the performance of the Chilean economy and its resilience to the crises of recent years, have remarked that this system of penalisation of short-term capital inflows may have been effective in preventing crises and promoting economic growth in Chile. However, as shown by Edwards (1999), a careful analysis of the evidence does not permit to confirm any positive impact of the penalisation of short-term capital inflows in the case of Chile.

Another suggested remedy is the proposal originally made by James Tobin to tax foreign exchange transactions or, more generally, all short-term financial flows. Proponents of the Tobin tax argue that it would help reduce financial market volatility while costing little to financial market participants, particularly for long-term transactions. A forceful argument which has been made against the proposed Tobin tax is that it would be difficult to implement. Other arguments against the Tobin tax are more closely related to economic theory. The Tobin tax would lead to an increase in transaction costs. Although the increase may be small relative to the transacted amounts, it could nevertheless amplify the market inefficiencies already observed within the current framework, which seem to partly arise from even low transaction costs and are apparent in particular the home bias and Feldstein-Horioka puzzles. Hence, it would seem difficult, in view of the present state of economic research, to provide a clear-cut case in favour of the Tobin tax.

Externalities are especially consequential in the development of the infrastructure of financial markets, including in particular payment and settlement systems. In many cases, economic agents are not able to endogenise the benefits associated with well-functioning payment and settlement systems, such as the ability to process transactions with a large number of potential counterparties and in conditions of high safety.

As a result, economic agents may content themselves with sub-optimal payment and settlement systems unless further incentives are provided to ensure that the existing systems are upgraded. It has now become widely accepted that the most secure systems for processing large value payments are real-time gross settlement systems.

For the euro, the payment system operated by the European System of Central Banks, TARGET, and falls into the category of real-time gross settlement systems. Over recent years, the setting up of a more secure infrastructure for the settlement of foreign exchange transactions has become a more prevalent issue. Ways were being sought to enhance the

foreign exchange settlement infrastructure so as to minimise the risk of payment system gridlock of the type occasioned by the failure of the Bankhaus Herstatt in 1974.

The second manifestation of financial market inefficiencies is information problems - or coordination problems. These occur when borrowers and lenders are not able to exchange all the information that would be required in order to conduct transactions in an efficient manner. Consider for example the so-called adverse selection problem. In order to avoid possible credit losses, lenders with limited information on the creditworthiness of borrowers will only be able to offer relatively high interest rates on loans. This will tend to attract the less creditworthy borrowers, which may result in credit rationing for the best borrowers.

More generally, when the financial soundness of borrowers is low and information asymmetry is high, there may be sizeable inefficiencies in financial markets. In such cases, the release of information revealing the true creditworthiness of borrowers may result in a disorderly withdrawal of funds when lenders realise that they do not have sufficient capital to buffer possible credit losses. The risk of such a scenario materialising is obviously particularly high when the modalities of corporate governance are such that the managers of firms do not abide by minimum standards of honesty and transparency.

These problems can explain why, when poorly managed, the liberalisation of financial markets can augment the risk of occurrence of financial crises. As discussed in a recent Economic Issues publication of the IMF, financial institutions may react to more competition with imprudent lending, or they may be unable to deal with the information problems which are magnified in the transition period.

Bernard and Bisignano (2000) show that information problems play an important role in the international inter-bank market. They argue that the problems can be so severe as to make it necessary to introduce a subsidy to market participants, in the form of implicit guarantees of support in case of failure. However, Bernard and Bisignano (2000) show that this appears to have led to moral hazard, resulting in excessive risk-taking which may have contributed to amplifying the financial market turbulence of the autumn of 1998.

These information problems can be remedied if financial market participants endeavour to measure risk exposures as adequately as possible and constitute capital buffers which are adequate in order to overcome possible losses.

Obviously, risk exposures should be determined according to several possible degrees of severity of circumstances. For normal circumstances outside periods of market stress, the so-called Value-at-Risk indicator can provide reliable measures of risk exposure. However, prudence requires that financial market participants also evaluate their risks of losses in periods of extreme market stress, so as to be able to gauge the extent to which their capital buffers would be consummated in such circumstances. The recommendations made by the Basle Committee on Banking Supervision specify how market risk exposures should best be calculated. As concerns credit risk exposures, the Basle Committee is in the process of preparing a new set of recommendations dealing with more accurate and varied measurement methods.

In the capital adequacy framework which has progressively been elaborated by the Basle Committee, an important role is played by the requirement that large financial institutions disclose information about their risk exposures and their capital buffers. When such requirement is in force, financial institutions with low capital buffers will find themselves being scrutinised more closely as they will be seen as potentially less creditworthy, which will provide incentives for a prompt upward adjustment of their capital buffers. In addition, the publication of information on the assessment of risks by large financial institutions will positively contribute to the mechanism of formation of a consensus amongst financial market participants about the true state of the creditworthiness of borrowers in the economy. Hence, the disclosure of information about risk exposures and capital buffers can help both to enforce discipline amongst financial market participants and to reduce information asymmetry amongst borrowers and lenders.

It would, therefore, seem to be very important, in order to fend off financial crises, to have both a solid financial infrastructure and sound financial institutions which publish information about their risk exposures and capital buffers. As suggested by Grenville (1999), the existence of such features in financial markets such as those of Australia and HongKong may help to explain why these economies were able to weather the episodes of financial turbulence in East Asia in 1997 and 1998 well, despite close trade links with the economies in crisis.

A further protection against the effects of financial turbulence, which has been suggested by Alan Greenspan, is the existence of a spare tyre, in the form of strong banks for the case when capital markets seize up, and in the form of deep and liquid capital markets for the case when banks seize up.

12.04 Role of Financial Intermediation

A financial intermediary is a financial institution such as bank, building society, insurance company, and investment bank or pension fund. A financial intermediary offers a service to help an individual/ firm to save or borrow money. A financial intermediary helps to facilitate the different needs of lenders and borrowers.

The reasons for financial intermediation centred on the power of information: how to get quality information at a reasonable cost. In this context, financial intermediaries perform 5 functions which are identified below:

Pooling the resources of small savers: Many borrowers require large sums, while many savers offer small sums. Without intermediaries, the borrower for a $100,000 mortgage would have to find 100 people willing to lend her $1000. That is hardly efficient. Banks, for example, pool many small deposits and use this to make large loans. Insurance companies collect and invest many small premiums in order to pay fewer large claims. Mutual funds accept small investment amounts and pool them to buy large stock and bond portfolios. In each case, the intermediary must attract many savers, so the soundness of the institution must be widely believed. This is accomplished through federal insurance or credit ratings.

Providing safekeeping, accounting, and payments mechanisms for resources: Again, banks are an obvious example for the safekeeping of money in accounts, the records of payments, deposits and withdrawals and the use of debit/ATM cards and checks as payment mechanisms. Financial intermediaries can do all of this much more cheaply than you or I because they take advantage of economies of scale. All of these services are standardized and automated on a large scale, so per unit transaction costs are minimized.

Providing liquidity: Liquidity refers to how easily and cheaply an asset can be converted to a means of payment. Financial intermediaries make is easy to transform various assets into a means of payment through ATMs, checking accounts, debit cards, etc. In doing this, financial intermediaries must many short-term outflows and investments will long-term outflows and investments in order to meet their obligations while profiting from the spread between long and short-term interest rates. Again, economies of scale allow intermediaries to do this at minimum cost.

Diversifying risk: Diversification is a powerful tool in minimizing risk for a given level of return. Financial intermediary's help investors diversify in ways they would be unable to do on their own. Mutual funds pool the funds of many investors to purchase and manage a stock portfolio so that investors achieve stock market diversification for as little as $1000. If an investor were to purchase stocks directly, such diversification would easily cost over $15,000. Insurance companies geographically diversify in ways that a Gulf Coast homeowner cannot. Banks spread depositor funds over many types of loans, so the default of any one loan does not put depositor funds in jeopardy.

Collecting and processing information: Financial intermediaries are experts at collecting and processing information in order to accurately gauge the risk of various investments and to price them accordingly. Individuals do not likely have to tools or know-how to do the same, and certainly could not do so as cheaply as financial intermediaries (once again, economies of scale are important here). This need to collect/process information comes from a fundamental asymmetric information problem inherent in financial markets.

Role of Financial Intermediaries in Reducing Information Cost

How do intermediaries reduce adverse selection and moral hazard? There are several ways.

Screening: Prior to a loan being given, a bank investigates a firm's or individual's credit history and financial status. Such information is fed into sophisticated computer programs that compute a "credit score" (known as a FICO score). The higher the score, the better the borrower. Also, banks specialize in lending to certain industries, especially local industries. This makes the screening process cheaper and more accurate, although the lack of diversification does increase the risk of the bank's asset portfolio

Monitoring: Once the loan is made, the bank must ensure that the borrower does not engage in risky activities that could lead to default. One way to prevent this is for banks to place

"restrictive covenants" into the loan contract to prohibit certain activities, and then to check compliance and enforce the agreement when necessary.

Creating long-term customer relationships: Repeat customers will not require the same effort for screening and monitoring those new customers. Also, customers have an incentive to establish a good repayment record in order to get loans from the same bank in the future.

Collateral: Requiring a potential borrower to pledge assets to be turned over in case of default reduces credit risk in several ways. Obviously, it protects the bank from a total financial loss in the event of a default. But it also screens out questionable borrowers (who will not have sufficient collateral) and reduces moral hazard problems since the borrower risks losing his/her property if a default occurs.

Credit rationing: Riskier borrowers will be expected to pay higher interest rates to compensate for this risk. However, ONLY the riskiest borrowers are willing to pay the highest rates. This is an extreme case of adverse selection. In this case, banks may be unwilling to assume the high-risk levels and simply refuse to lend to these types of borrowers. Alternatives, banks would lend out only small amounts, giving the borrower the incentive to establish a good payment record to obtain additional loans.

Disclosure: Disclosure rules for public companies also mitigate the problems of asymmetric information. The SEC requires companies that sell securities to the public to publish quarterly financial statements and disclose any relevant information in a timely manner. The requirements are not foolproof. As your book notes, the scandals with Enron and WorldCom, among others, demonstrate that financial statements may be manipulated in ways to deceive investors.

12.05 Review Questions

1.   Examine the role(s) 0f international intermediation in our National economy(5marks)
2.   Discuss the international market and in the way(s) it influence our economic
        growth and development. (5marks)
3.   Certain rules concern the manner in which financial institutions operate. Evaluate
        these rules and how they operate. (5marks)
4.   Appraise the types of international markets you know, highlighting the contribution
        of each to international financing. (5marks)

MODULE 13

13.00   CORPORATE RESTRUCTURING, MERGERS AND ACQUISITIONS

13.01 Learning Outcomes

On successful completion of this module, students should be able to:

  i   Discuss Corporate restructuring and its purpose

  ii   Appraise the forms of merger and acquisition and merger tactics

  iii Describe the instrument of friendly and hostile bids by companies

  iv   Analyse the reasons for failure of mergers and acquisition

  v   Ascertain how merger is regulated by the government

13.02   Basic Forms of Acquisition

A merger between two or more companies, or a takeover i.e. acquisition may be achieved through these methods:

  i.   **Holding company:** A new company is formed by controlling shares in the acquired company.
  ii. **Total absorption:** Under this arrangement, the predator company becomes the holding company while the target company becomes the subsidiary.

Types of Merger are horizontal, vertical, and conglomerate mergers.

Horizontal Merger- It is a combination of two or more companies in the same stage of production or distribution or area of business. This type of merger is also referred to as replicative merger because companies that are in competition with one another would merge to form a single entity to benefit from synergy, economies of scale and exploit more benefits in the market. The merger of commercial banks in Nigeria a few years back under the CBN consolidation policy is an example of Horizontal Merger.

Vertical Merger- This is a combination of two or more companies engaged in different stages of production or distribution to complement one another. Here, the companies involved are not in competition with one another but have a seller-buyer relationship. When a company combines with the customer, it is called forward merger, but when it combines with a supplier of raw materials, it is called backward merger. A vertical merger is sometimes referred to as complementary merger.

Conglomerate Merger- This is a combination of companies engaged in unrelated lines of business activity. The companies involved are not in competition with one another, nor do they have a buyer-seller relationship. They merge to form big companies e.g. Dangote PLC.

Types of Restructuring

i **Business Restructuring:** This involves the reorganization of business units or divisions. It includes diversification into new businesses, outsourcing, divestment, brand acquisitions etc.

ii **Asset Restructuring:** It involves the acquisition or sale of assets and their ownership structure. Common examples of assets restructuring are a sale and lease back of assets, securitization of debt, receivable factoring, etc.

iii **Corporate Restructuring:** The basic purpose of corporate restructuring is to enhance the shareholder value. Therefore, a company should continuously evaluate its portfolio of businesses, and ownership and assets management to find opportunities for increasing the shareholder value. It should focus on assets utilization and profitable investment opportunities and reorganize or divert less profitable or loss-making businesses/products.

The company can also enhance value through capital restructuring. It can design innovative securities that help to reduce the cost of capital.

Leveraged Buy-Outs: This differs from the ordinary acquisition in two ways:

i A large fraction of the purchase price is debt-financed. Some, perhaps all, of this debt is funk, that is, below investment grade.

ii The LBO "goes private" and its shares no longer trade on the open market – Nigeria Stock Exchange (NSE). The remaining equity in the LBO is privately held by a small group of usually institutional investors. When this group is led by the company's management, the acquisition is called a management buy-out (MBO).

Debt typically forms about 70 – 90% of the purchase consideration and it may a low credit rating. LBO's generally involve payments by cash to the seller. The main motivation in LBO's is to increase wealth rapidly in a short span of time. A buyer would typically go public after a period of four or five years/,/ and make substantial capital gains.

LBO Targets: The following companies are usually targets for the leveraged buy-outs:

i High growth, high market share companies
ii High profit potential companies
iii High liquidity and high debt capacity companies
iv Low operating risk companies

LBO Evaluation- the Discounted Cash Flow (DCF) approach is used to value an LBO. As its transactions are heavily financed by debt (debentures, bonds) the risk of the lender is very high. Therefore, in most deals, they require a stake in the ownership of the acquired company.

13.03 Valuation of Business and Entities

In a merger or acquisition, the acquiring company is buying the business of the target company, rather than a specific asset. Therefore, one can say that a merger is a special type of capital budgeting decision. What is the value of the target company? This value should include the effect of operating efficiencies and energy?

DCF Approach

Mergers and acquisitions involve a complex set of managerial problems than the purchase of an asset. The DCF (Discounted Cash Flow) approach is an important tool in analyzing mergers and acquisitions.

In order to apply the DCF technique, the following information is needed:

   i   Estimation of free cash flows over the horizon period
   ii   Estimation of the value of cash flows beyond the horizon period.
   iii   Discount rate

Earnings are the basis for estimating free cash flows.

Free cash flows include:

   i   Adjustments for depreciation
   ii   Capital expenditure
   iii   Working capital

The appropriate discount rate depends on the risk of the expected cash flows of the target company. Given the target company's target capital structure, its WACC is used as the discount rate.

The following steps are involved in the valuation of a merger or acquisition:

a. Identify growth and profitability assumptions
b. Estimate cash flows and terminal value
c. Estimate the cost of capital
d. Compute the present value of cash flows
e. Decide if the acquisition is attractive on the basis of present value.
f. Decide if the acquisition should be financed through cash or exchange of shares.
g. Evaluate the impact of the merger on EPS and price-earnings ratio.

13.04   Basis of Merger

In merger negotiations, the most important issue is the basis upon which the values of the merging units will be determined. Remember that at the point of negotiation, each of the merging units, which would have operated separately before, would have its own number of shares of outstanding, current earnings per shares, market value per share, net assets value, etc. An agreement should be reached on the basis for determining the value to be placed on each of the merging units. An agreement should also be reached on the method of settling

the shareholders of the acquired units. The various possible bases for determining the values of the margining units are:

1. Net assets value
2. Earning per share
3. Market value per share
4. Capitalization of earnings

Net Asset Value Basis

Under the net asset value method, the net asset per share is obtained by dividing the value of equity of the firm by the number of shares outstanding.

Net assets per share   =   Value of Equity / No. of ordinary shares

The net asset value per share may differ from the market value per share. The method is favoured where the net asset value substantially exceeds the market value. Remember that the book value is an index of the amount of physical facilities which the unit is making available in the merger. Thus if the earning power of the assets were low before the merger, when the unit was operating separately, it could be reasoned that under more effective management under a merger, the assets could once more achieve normal earning power.

We shall illustrate with two firms, Ebunso Plc and Auta Plc whose balance sheets are shown below:

	Ebunsoplc	Auta Plc
		₦
Ordinary shares (25 shares)	25,000,000	12,500,000
Preference shares	5,000,000	
Share premium account	-	500,000
Profit or loss account	9,500,000	1,000,000
10% debenture	3,750,000	1,250,000
	₦ 43,250,000	₦ 15,250,000
Fixed assets	30,500,000	8,750,000
Net current assets	12,750,000	6,750,000
	₦ 43,250,000	₦ 15,250,000

The merger agreement is that the values of both firms should be on the basis of their net asset values, and that Ebunso Plc should exchange its shares in settlement of the shareholders of Auta Plc.

We can obtain the net asset per share of both firms as follows:

Net assets per share = $\dfrac{\text{Value of equity}}{\text{No. of shares outstanding}}$

For Ebunso Plc:

Net assets per share = $\dfrac{\text{Total assets} - \text{(Preference share + Debenture)}}{\text{No. of shares outstanding}}$

$$= \frac{43,250,000 - (₦5,000,000 + ₦3,750,000)}{1,000,000}$$

$$= \frac{34,500,000}{1,000,000}$$

$$= ₦34.5$$

For Auta Plc:

Net assets per share = $\dfrac{\text{Total assets} - \text{Debenture}}{\text{No. of shares outstanding}}$

$$= \frac{(₦15,250,000 + ₦1,250,000)}{500,000}$$

$$= ₦28$$

Ebunso Plc has a net asset per share of N34.5 while Auta Plc has a net asset share of N28. In order to preserve the net assets of all the shareholders in the enlarged Ebunso Plc, the ratio of exchange of Ebunso Plc shares will be 280:345, that is 56:69. This means that for every 69 shares in Ebunso Plc, the enlarged Ebunso Plc will issue 56 shares to the shareholders of Auta Plc. If it is issued more than 56 shares for every 69 of its own share, it would amount to generosity to the shareholders of Auta Plc at the expense of its own shareholders whose asset value will decline. On the other hand, if it issues less than 56 shares for every 69 shares of its own, the shareholders of Auta Plc will be disadvantaged.

We can obtain the total number of shares which Ebunso Plc will issue in exchange for the outstanding 500,000 shares in Auta Plc as follows:

No. of Ebunso Plc Share to be issued To Auta Plc = $\dfrac{\text{No. of shares outstanding in Auta}}{1}$ x $\dfrac{\text{Net asset per Plc shares Auta Plc}}{\text{Net asset per share in Ebunso Plc}}$

$$= \frac{500,000}{1} \times \frac{280}{345}$$

$$= \frac{500,000}{1} \times \frac{56}{69}$$

$$= \underline{405,797 \text{ shares}}$$

Earnings per Share Basis

Earnings per share is another basis which could be adopted in a merger. This applies where it is desired to preserve the earnings per share of the shareholders of the merging firms. Quite naturally, shareholders and financial managers bother much about the effect on the earnings per share of any proposed merger. Unlike the market price per share which is influenced by so many forces, the effect on the earnings per share of any merger can be seen much more directly.

To illustrate earnings per share as a basis for a merger, we shall assume the following additional data about Ebunso Plc and Auta Plc.

	Ebunso Plc	Auta Plc
Sustainable profit after tax, available to equity	₦ 6,000,000	₦ 3,750,000
Current market value per share	₦ 60	₦ 67.5
P/E ratio	10	9
Current market price of debenture	125%	125%

Assume further that during the merger negotiation, it was agreed to preserve the earnings per share of the shareholders of both companies. The basis for the exchange of shares can be arrived at as follows:

Earnings per share $=\dfrac{\text{Sustainable annual profit after tax}}{\text{No. of share outstanding}}$

For Ebunso Plc:

Earnings per share $= \dfrac{₦6,000,000}{1,000,000}$

$= ₦6$

For Auta Plc:

Earnings per share $= \dfrac{₦3,750,000}{500,000}$

$= ₦7.5$

The earnings per share of Ebunso Plc is ₦6 while that of Auta Plc is ₦7.5. A fair basis for merger that will preserve the earnings per share of the shareholders of both companies is one that will be based on the ratio of 7.5:6.0, that is 75:60. This means that for every 60 shares of Ebunso Plc, the surviving company, it will issue 75 shares to Auta Plc. The total number of shares which Ebunso Plc will issue for the outstanding 500,000 shares of Auta Plc can be calculated as follows:

		No. of shares in			
No. of shares of Ebunso	=	$\underline{\text{Auta Plc}}$	x	$\underline{\text{eps of Auta}}$
		1		eps of Ebunso

$$= \quad \frac{500,000}{1} \quad \text{x} \quad \frac{7.5}{6}$$

$$= \quad \underline{625,000 \text{ shares}}$$

We can see that for the 500,000 shares held in Auta Plc, 625,000 shares of Ebunso Plc will be issued in the settlement. It means that for every ten shares held in Auta Plc before the merger, twelve and a half shares of Ebunso Plc will be issued in the settlement.

Market Value Per Share Basis
Market values reflect the market assessment of the values of the merging units. Quite often, market values exact strong influence in merger negotiations and could be adopted as the basis for a merger. Assume, the market value of Ebunso Plc is N60 per share while that of Auta Plc is N67.50 per share. In order to preserve the market values for the shareholders of both companies, the basis for the exchange of shares will be in the ratio of 67.5:60. This can be reduced 9:8. This means that for every 8 shares in Ebunso Plc, the directors of Ebunso Plc will issue 9 shares of Ebunso Plc to the shareholders of Auta Plc in the settlement. The total number of shares to be issued in exchange for the 500,000 shares outstanding in Auta Plc will be obtained as follows:

		No of shares in		
No. of Ebunso's	=	$\underline{\text{Auta Plc}}$	x	$\underline{9}$
be issued to Auta Plc		1		8

$$= \quad \frac{500,000}{1} \quad \text{x} \quad \frac{9}{8}$$

$$= \quad \underline{562,500 \text{ shares}}$$

Thus, the number of Ebunso Plc shares which a holder of one share in AUta Plc will receive can be calculated as follows:

		Total number of Ebunso's shares
Net shares per	=	$\underline{\text{to be issued to Auta Plc}}$
one Auta Plc share		Total number of shares
		Outstanding in Auta Plc

$$= \quad \frac{562,500}{500,000} = 1.125$$

In some merger agreement, the value placed on a firm on acquisition may be higher than the current market value of the firm. This may happen in a situation where the acquiring company values the contribution the acquired company will make to it very highly. For example, in a depressed industry, the market may over discount the gloomy outlook and this will result in a

low market valuation of the firm. But if the acquiring firm considers the proposed firm to be worth more than it is in the general market, it could decide to go ahead with the merger at a valuation above the current market price. Furthermore, situations do arise in which shareholders of the proposed firm may require some inducement by way of higher prices, for them to part with their investment. Typically, the offer prices may be in the range of 10 – 20% above market price before the merger announcement.

A situation could also arise in which the market values of the shares of the merging firms could be equal but with differing earnings per share and price-earnings ratio. If the merger is based on the equality of the market prices, a state of inequity could develop immediately after the merger. We can illustrate. Assume that two firms Emab Plc and Erisco Plc have the following facts.

	Emab Plc	Erisco Plc
Earnings	₦ 1,250,000	₦ 500,000
No. of shares outstanding	50,000	25,000
Eps	₦ 25	₦ 20
P/E ratio	12	15
Market value per share	₦ 300	₦ 300

Assume also that both firms are to merge on the basis of market price and that Emab Plc will be the surviving firm. The ratio of exchange of shares should be on one to one basis. Consequently, Emab Plc should issue 25,000 of its shares in exchange for Erisco Plc 25,000 shares. This will bring the total number of shares in the enlarged Emab Plc to 75,000 shares. Assume further that there is no increase in earnings after the merger. Then, the earnings per share of the enlarged Emab Plc will be a combination of the earnings of both firms before the merger divided by the total number of shares in the enlarged Emab Plc.

Total earnings of enlarged Emab Plc	=	Earnings of Emab Plc	+	Earnings of Erisco Plc
	=	N1,250,000	+	N500,000
	=	<u>N1,750,000</u>		

Total number of shares in enlarged Emab Plc	=	No. of shares in Emab Plc	+	No. of shares in Erisco Plc
	=	50,000	+	25,000
	=	<u>75,000 shares</u>		

Then the earnings per share of enlarged Emab Plc will be:

Eps of enlarged   =   ₦1,750,000
Emab Plc   75,000

                  =   ₦ 23.33

We can tabulate as follows:

| | Shares in enlarged Emab Plc after merger | Eps | |
		Before merger	After merger
Emab Plc	50,000	₦25	₦23.33
Erisco Plc	25,000	₦20	₦23.33

The state of inequity is exposed. Erisco Plc shareholders whose earnings per share hitherto was ₦20, have their earnings per share increased to ₦23.3 after the merger while Emab Plc shareholders whose earnings per share before the merger was ₦25 have their earnings per share reduced to ₦23.33. In the circumstance, Emab Plc share shareholders are disadvantaged.

The value of the enlarged Emab Plc after the merger cannot be determined with certainty. It depends on whether the enlarged Emab Plc will retain its former P/E ratio or the P/E ratio of Erisco Plc before the merger. Let us assume that the enlarged Emab Plc sells at Erisco Plc P/E ratio of 15. We can calculate the market value per share of the enlarged Emab Plc as follows:

Market value   Eps of enlarged   x   P/E ratio
Per share   =   Emab Plc

             =   ₦23.33 x 15

             =   ₦350

Here the shareholders of both firms will benefit from the N50 increase in the market value per share. But if the enlarged Emab Plc shares sell at Emab Plc ratio of 12 before the merger, then the market value per share of the enlarged Emab Plc will be:

Market value   Eps of enlarged   x   P/E ratio
Per share   =   Emab Plc

             =   ₦23.33 x 12

             =   ₦280

Here the shareholders of both firms would suffer a dilution of the market value of their investments by ₦20 per share.

Capitalization of Earnings Basis

In investment analysis, it is conventional to determine the value of a firm as a going concern by capitalization of its future earnings stream. If this method is agreed upon as the basis of a merger, the acquiring firm would merely capitalize the sustainable earnings of a proposed firm using its own cost of capital as the capitalization of a proposed firm using in our previous illustration on pages 267-270 we can determine the value of Auta Plc by the following steps:

a.   Obtain the cost of equity of the acquiring firm, Ebunso Plc.
b.   Obtain the cost of debt of Ebunso Plc
c.   Obtain the weighted average cost of capital Ebunso Plc.
d.   Capitalize the sustainable earnings of Auta using the cost of capital of Ebunso, Plc.

Cost of equity of   =   Sustainable annual profit
Ebunso Plc   Market price of equity

                           =   ₦ 6,000,000
                                          ₦60 X 1,000,000

                           =   ₦6,000,000
                                          ₦60,000,000

                           =   10%

Cost of debt of
Ebunso Plc   =   Coupon rate   x   Nominal value of debt
(assuming a 10%   1   Market value of debt
Coupon rate)

                           =   10%   x   ₦100
                                                                N125
                           =   8%

Assuming a tax rate of 50%, then the after tax cost of debt will be

After tax cost =   8% (1 – 0.5)

                 =   4%

Weighted average =   (Cost of equity x sixe of equity) + (After tax cost of debt
 Cost of capital   x size of debt
                     =   Size of equity + Size of debt

                     =   10% x ₦ 60,000   +   4% (1.25 x ₦3,750,000)
                              ₦60,000,000   +   (₦3,750,000 x 1.25)

$$= \frac{\text{₦} 6,000,000 + 0.04(4,687,500}{\text{₦}60,000,000 + 4,687,500}$$

$$= \frac{6,187,500}{64,687,500}$$

$$= 0.0956$$

$$= \underline{9.56\%}$$

Finally, the sustainable annual profit of Auta Plc that is being acquired, is capitalized with 9.56% as the capitalization with 9.56% as the capitalization rate.

Value of Auta = $\frac{\text{Sustainable earnings of Auta Plc}}{\text{Cost of capital of Ebunso Plc}}$
  Plc

$$= \frac{3,750,000}{9.56\%}$$

$$= \underline{\text{₦}39,225,941}$$

The value of Auta Plc is put at ₦39,225,941. Under conventional project appraisal, this is the highest price Ebunso Plc will be prepared to pay for acquiring Auta Plc to make the merger an economic venture. Since the shares of Ebunso Plc is currently selling at N60 per share, the number of Ebunso Plc shares to be issued to settle the shareholders of Auta Plc is obtained as follows:

No. of shares $\quad = \qquad \frac{\text{Value of Auta Plc}}{\text{Market price per share of Ebunso Plc}}$

$$= \frac{\text{₦} 39,225.941}{\text{₦}60}$$

$$= \underline{653.766 \text{ shares}}$$

The number of shares outstanding in Auta Plc is 500,000. This 500,000 shares will be allocated 653,766 shares in the enlarged Ebunso Plc. The ratio of exchange for the new shares can be obtained as follows:

Rate of exchange $\quad = \qquad \frac{\text{No. of new shares in Ebunso Plc}}{\text{No. of old shares in Auta plc}}$
of shares

$$= \frac{653,766}{500,000}$$

$$= \quad \triangle \quad \underline{1.3}$$

This means that for everyone share held in Auta Plc, the shareholder receives 1.3 shares in Ebunso Plc after the merger. Put in another form, every 100 shares in Auta Plc receives shares of Ebunso Plc.

We can see that different bases of merger of Ebunso Plc and Auta Plc produce different valuations of Auta Plc and consequently, different number of Ebunso Plc shares to be issued in settlement of the shareholders of Auta Plc. This is tabulated below.

Table 7.1
Different Basis for Merger and Different Valuation of Auta Plc

S/N	Basis of Merger	No of shares of Ebunso to be issued to Auta	Market value of new shares (No. of shares x unit price)
1	Net asset value	405,797	₦24,347,820
2	Earnings per share	625,000	₦ 37,500,000
3	Market value per share	562,500	₦ 33,750,000
4	Capitalization of earnings	653,766	₦ 39,225,980

The impact of the different bases of a merger on the valuation of the merging firm is very glaring from the Table. While capitalization of earnings basis gave the market value of Auta Plc as ₦39.2million, the net asset value method valued the firm at ₦24.3million.

There is no defined formula for selecting the appropriate basis for a merger. It depends on the bargaining skill of the parties during the merger negotiations. It is, therefore, anybody's guess as to what the terms of any merger will be. And whether the offer made to the shareholders of a firm that is being absorbed is fair or not will depend on the circumstances at the time of the merger.

13.05 Factors to be Considered in Mergers and Acquisitions

The factors include:

      i   Consideration of valuation
      ii   Form of consideration
      iii   Attitude of a target company's shareholders
      iv   Attitude of a predator to company's shareholders
      v   Contract employment of key management staff
      vi   New dividend policy after a merger
      vii   Accounting treatment
      viii   Taxation implication
      ix   Company culture
      x   Goodwill
      xi   Location
      xii   Age of assets
      xiii   Predict lines capital

xiv   Patent right.

13.06   Factors Influencing the Likelihood of Successful Acquisitions

1. **Ownership**
   a. Ascertain the major shareholders
   b. Ascertain the capital structure of the company
2. **Management**
   a. Efficiency and capability of the management team
   b. Value of the management team in the capital market
3. **Finance**
   a. Purchase consideration
   b. Increased profitability after acquisition
   c. Mode of effecting purchase consideration cash, shares or loan stock.
4. **Rival Bidder**
   a. Ascertain the existence and strength of any rival bidder
5. **Competition**
   a. Ascertain the competitive nature of the market and the major competitors
6. **Taxation**
   a. Any tax advantage to be derived? E.g. un-utilized capital allowances.

13.07   Reasons for Failure of a Merger or Acquisition

There are several reasons responsible for the failure of a merger or acquisition. They include:

1.   Excessive Premium: An acquirer may pay a high premium for acquiring its target company. The premium may exceed the benefits.

2. Faulty Evaluation: Sometimes, acquirers make a wrong assessment of the benefits of the acquisition and end up paying a higher price.

3.   **Lack of Research:** Acquisition requires gathering a lot of data and information and analyzing it. It requires extensive research.

4.   Failure to Manage post-merger Integration: Sometimes, acquirers is unable to integrate the acquired companies in their businesses. They overlook the organizational and cultural issues.

To avoid these problems, the acquiring company needs to have an acquisition and merger strategy. The acquisitions must be well planned, target companies carefully selected through research and screening, and proper financial evaluation.

13.08   Financial Benefits of Merger and Acquisition

There are many ways in which a merger/acquisition can enhance financial synergy and benefits. Some of these economic benefits are:

1. Growth Opportunity- A company that may be constrained to growth, an internal development due to shortage of funds, can take advantage of a merger with another company, and thus solve the problem of financial constraints.

2. Investment opportunity- Acquisition provides an investment opportunity for shareholders surplus funds which would increase the market value of the shares.

3. Borrowing Power- The risk of insolvency can be reduced and the capability of the combined company to service a larger amount of debt could be enhanced due to the financial stability of the company. Therefore, the borrowing capacity of the combined company would be enhanced.

4. Cost Effectiveness- A combined company is able to realize economies of scale in transaction and floatation costs related to an issue of capital. The merged company makes a larger security issue and thereby achieves cost-effectiveness.

5. Diversification of Risk- A merged company is able to diversify the unsystematic risk of the business.

13.09 Mechanics and Tactics of a Merger

According to Brealey Myers and Allen (date of publication), buying a company is a much more complicated affair than buying a piece of machinery. Therefore, we should look at some of the problems encountered in arranging mergers. In practice, these problems are extremely complex and therefore specialists must be consulted. There are legal, tax, and accounting issues to deal with.

In view of the complex nature of mergers, the following tactics are employed:

Friendly Bid: A bid in which the management of an acquiring company and a target company work out suitable terms that are agreed to by both companies. A company that was once making a takeover attempt but ends up discussing a merger with a target company is referred to as Yellow Knight. While a company that is Prime for takeover but has not was approached by an acquiring company is known as Sleeping Beauty.

Hostile Bid: This is a bid that a target company resists. A company that makes a hostile takeover offer on a target company is known as a Black Knight. Where a second, unsolicited bidder in a corporate takeover enters the scene in order to take advantage of any problems between the first bidder and the target company such a second bidder is known as Gray Knight.

13.10 Evaluating Financial Performance of Merged Companies including Reasons for their Successes and Failures

Mergers and Acquisitions are used in improving company's competitiveness and gaining a competitive advantage over other firms through gaining greater market share, broadening the portfolio to reduce business risk, entering new markets and geographies, and capitalizing on economies of scale (Saboo & Gopi, 2009). Mergers and Acquisitions agreement is taken not necessarily because of lack of corporate strength but an avenue to create synergy. Many corporations find the best way to get ahead is to expand ownership boundaries is through mergers and acquisitions (Ismail, Abdou & Annis, 2011). The potential economic benefits of

Mergers and Acquisitions are changes that increase the value that would not have been made in the absence of a change in control (Pazarkis, *et al.*, 2006). These changes in control are potentially most valuable when they lead in the redeployment of assets, providing new operating plans and business strategies. The motives behind mergers and acquisitions are to improve revenues and profitability, faster growth in scale and quicker time to market, and acquisition of new technology or competence. This is largely the reason why merger and acquisition are perceived as effective methods of improving corporate performance.

The question of merger success or failure is the central topic of this thesis. By choosing a merger that did not get completed, it is obvious that one case can be classified as a failure. It is still important to analyse why it did not go through. On the other hand, it is equally important to understand why the success case chosen in this thesis can be labelled as a success. When analysing the success or failure of a merger process it is important to look at the motives, strategies and objectives in the pre-merger planning and compare it with the results after the merger date. According to earlier research, failures include a lack of adequate 1-15 organizational fit, meaning similarity in cultures, systems, and structures that will facilitate the procedure (Lubatkin, 1983; Peng, 2006). Also, the stakeholders' concerns in the post-M&A phase can be a problem, with the fear of losing their jobs, the restructured responsibilities, and diminished power. This could all contribute to an M&A failure (Bekier & Shelton, 2002). The role of human resource departments (HR) also plays a critical role in succeeding with M&A. Waight (2004) states that it is not only the financial, economic or commercial factors of the M&A that will affect the outcome of the pre-planning, but also the HR-department. A detailed merger plan over how the implementation of the M&A should be executed is important. The plan should contain elements such as organizational structure, management structure, product lines, and business process. The speed of the integration process is also considered as a factor of success (Camera & Renjen, 2004). It is important to integrate well, but it is also important to integrate quickly. As opposed to the failures, in the mergers that did succeed, experience and preparations are mentioned as key factors. The M&A process has a greater chance of succeeding if the organizations and managers have experience from previous M&A. Further, the strategic similarities are also mentioned as success factors. The better the strategic fit between the two companies, the easier to succeed (Libation, 1983). According to Chapman (2004) the screening and pre-planning phase are also critical success factors for M&A. The more planning prior to the M&A the better, since the pre-planning phase will affect all areas of business and how the integration is handled (Chapman, 2004). First brook (2007) also emphasizes the importance of pre-planning in order to reach a strategic fit between companies in an M&A. It is important that the M&A-planning has a clear view of the acquired company's role in the strategy after the M&A. Even when a strategy is clear, many companies 16 do not spend enough time to search for companies that will be the best fit for the strategy. Often the acquiring company just acquires the first company that looks like a fit (First brook, 2007). This indicates that the synergies that should have occurred do not occur, due to the lack of matching and complementary strategic capabilities between the companies. Strategic incompatibilities are likely to be more problematic in some situations than in others. M&A that cut across national boundaries are more demanding because of the different nationalities involved, and because there is a bigger need for cultural sensitivity in resolving strategic incompatibilities (Mayer & Altenborg, 2008). When the merger is also strongly influenced by national political considerations, the problem of resolving strategic

incompatibilities is likely to increase (Bruner, 2005). Along with the pre-planning and strategic fit of organizations, the organizational fit could also inflict the success of an M&A. Organizational fit can be measured by the number of organizational adjustments that have to be implemented after the M&A (Castro & Uhlenbruck, 1998). Peng (2006) explains organizational fit as similarities in culture, structure and systems. He emphasizes the importance of investigating the organizational fit before acquiring a company, and organizational fit should be a substantial part of the screening process when considering an M&A. However, Peng points out that this is seldom the case. Almost 80 % of the acquirers have not done accurate studies on the organizational fit between the companies. Management motives are mentioned as central motives when understanding why M&A occur. In understanding factors of success and failure in M&A it could also be useful to look to management, as a common problem in M&A could be relational problems (Pablo, 1994). Being manager in a company merging with another company and getting a new role could 17 create obstacles. If the acquirer is a much larger company than the acquired company, there could be power differentials between the companies. The largest company's managers would have more influence, which could lead to the managers from the acquired company feeling unwelcome and run over. The acquirer company's managers could feel pressured to implement new orders quickly to meet performance expectation, which could be viewed as greater capabilities to enforce their preferences than the other company's manager. It is not only the size differences that matter for the managers but also the beliefs of superiority and inferiority between the companies. From being in the core of the organization in one company, managers risk reducing their significance in the overall business, ending up with less impact, status, and power relative to the managers from the other company. One of the most important causes of M&A failures is the dominating company's attitude and beliefs about superiority and inferiority towards the other company.

13.11   Effects of Government Regulations on Mergers and Acquisitions

In Nigeria, mergers by private or public companies are principally regulated under the Investments and Securities Act 2007 (the "ISA") and the Rules and Regulations made pursuant to the ISA (the "SEC Rules"). The listing rules of the Nigerian Stock Exchange (the "Listing Rules") also contain regulations that impact on merger transactions by public listed entities. The provisions governing schemes of arrangement are contained in the Companies and Allied Matters Act, Chapter C20, Laws of the Federation of Nigeria 2004 ("CAMA").

Pursuant to the ISA, the key regulator of mergers in Nigeria is the Securities and Exchange Commission (the "SEC"). The SEC is also responsible for reviewing mergers to ascertain whether a proposed transaction would give rise to competition concerns.

In addition, there are other sector-specific laws that regulate merger transactions - the prior approval of the relevant sector regulator is required for a change of control.

   a.   The Banks and other Financial Institutions Act, Cap B3, Laws of the Federation of Nigeria 2004, which regulate the financial sector requires the approval of the Central Bank of Nigeria ("CBN");

b. The Nigerian Communications Act 2003, which regulates the telecommunications industry requires the approval of the Nigerian Communications Commission ("NCC");

c. The Insurance Act 2003, which regulates the insurance industry requires the approval   of the National Insurance Commission ("NAICOM");

d. The National Broadcasting Commission Act, Chapter N11, which regulates the broadcasting sector requires the approval of the National Broadcasting Commission; and

e. The Electric Power Sector Reform Act 2005 which regulates the electricity requires the approval of the Nigerian Electricity Regulatory Commission.

These laws and guidelines are binding on the companies in that industry in addition to the SEC Rules.

The merger control regime

A "merger" is defined in section 119 of the ISA as "any amalgamation of the undertakings or any part of the undertakings or interest of two or more companies or the undertakings or part of the undertakings of one or more companies and one or more bodies corporate". The SEC Rules also define mergers in similar terms and makes a distinction between "horizontal mergers" i.e. mergers involving direct competitors and "vertical mergers" which involve mergers between firms in non-competitive relationships.

Section 118 (1) of the ISA provides that all mergers in Nigeria shall be subject to the prior review and approval of the SEC. This applies irrespective of whether the merging entities are public or private companies. Section 119 of the ISA provides further that a merger may be achieved in any manner, including through either a purchase or lease of the shares, interest or assets of the other company in question; or an amalgamation or other combination with the other company in question.

Notably, the ISA and SEC Rule provide certain exemptions to the requirement to obtain SEC approval. It is only with respect to transactions involving holding companies acquiring shares solely "for the purpose of investment" and not using same by voting or otherwise to cause or attempt to cause substantial restraint of competition or where the acquisition of such shares by a holding company will not tend to create monopoly in any line of business enterprise – that is a holding company that intends to acquire the shares of its subsidiary for investment purposes only -; as well as in the case of "small mergers", that the merging entities are not required to notify the SEC of that merger but are required, only, to inform the SEC at the conclusion of the merger.

There are three categories of mergers for purposes of approval, and SEC Rule 232 (B) provides that the threshold for each category of merger shall be determined by reference to a combination of assets or turnover or a combination of both turnover and assets in Nigeria of the merging entities. The lower threshold for "small mergers" is below =N=250,000,000

(approximately US$ 1.6 million), the threshold for "intermediate mergers" is between =N=250,000,000 to =N=5,000,000,000, while the threshold for "large mergers" is above =N=5,000,000,000 (approximately US$32 million).

Small Mergers

Section 122 (1) of the ISA provides that a party to a small merger is not required to notify the SEC of the merger unless it is specifically required by the SEC to do so and may implement the merger without SEC approval. The parties may however, voluntarily notify the SEC of the merger. SEC Rule 230 further specifies that in a small merger, the merging entities are not required to notify the SEC of that merger but shall only inform the SEC at the conclusion of the merger.

The SEC may, within 6 months after the small merger has been implemented, require the parties to notify the SEC of the merger in the prescribed manner and form if, in the opinion of the SEC, the small merger may substantially prevent or lessen competition; or cannot be justified on public interest grounds. A party to a small merger required to notify the SEC of the merger is not to take any further steps to implement the merger until the merger has been approved or conditionally approved.

Within 20 working days after all parties to a small merger have fulfilled all their notification requirements in the prescribed manner and form, the SEC- may either extend the period within which it has to consider the proposed merger by a single period not exceeding 40 working days and, in that case, must issue an extension certificate to any party who notified it of the merger; or after having considered the merger, may notify the parties of its approval of the merger; approval of the merger subject to any conditions; the prohibition of the implementation of the merger, if it has not been implemented; or if already implemented, a declaration that that merger is prohibited. If, upon the expiration of the 20 working day period or the extension, the SEC has not notified the parties of its decision, the merger shall be deemed as having been approved, subject to section 127 of the ISA. Section 127 (1) of the ISA provides that the SEC reserves the right to revoke its own decision to approve or conditionally approve a merger of any size on any of the following grounds if the decision was based on incorrect information for which a party to the merger is responsible; the approval was obtained by deceit; or a company concerned in the merger has breached an obligation attached to the decision.

If the merger is approved by the SEC, the parties can apply to the court (Nigeria's Federal High Court) for the merger to be sanctioned after which, the merger will become binding on the companies in question. The court may by the order sanctioning the merger or subsequent order make provision for any or all of the following matters:

   a.   The transfer to the transferee company of the whole or any part of the undertaking and of the property or liabilities of any transferor company;

   b.   The allotment or appropriation by the transferee company of any shares, debentures, policies or other like interests in that company which under the

compromise or arrangement are to be allotted or appropriated by that company to or for any person;

c.   The continuation by or against the transferee company of any legal proceedings pending by or against any transferor company;

d.   The dissolution, without winding up, of any transferor company;

e.   The provision to be made for any persons who in such manner as the court may direct, dissent from the compromise or arrangement; and

f.   Such incidental, consequential and supplemental matters as are necessary to secure that the reconstruction or merger shall be fully and effectively carried out.

An order for the dissolution, without winding up, of any transferor company will only be made where the whole of the undertaking and the property, assets and liabilities of the transferor company are being transferred into the transferee company; and the court is satisfied that adequate compensation has been made with respect to the employees of the company to be dissolved. Where an order provides for the transfer of property or liabilities, that property or liabilities shall be transferred to and become the property or liabilities of the transferee company and in the case of any property, if the order so provides, be freed from any charge which by virtue of the compromise or arrangement ceases to have effect.

Every company in relation to which a merger order is made is required to deliver a copy of the order to the SEC for registration within 7 days after the making of the order. Thereafter, a notice of the order must be published in the Gazette and in at least one national newspaper. The SEC is also required to publish a notice of the decision in the Gazette, and; to issue written reasons for the decision if it prohibits or conditionally approves the merger; or is requested to do so by a party to the merger.

IV.   Intermediate and Large Mergers

Section 123 of the ISA provides that in the case of an intermediate or a large merger, the primary acquiring company and the primary target company are required to each provide a copy of the notice of that merger in the prescribed manner and form to any registered trade union that represents a substantial number of their respective employees; or to the employees concerned or to representatives of the employees concerned, if there are no such registered trade unions.

With respect to intermediate mergers, section 125 (1) of the ISA provides that within 20 working days after all parties to an intermediate merger have fulfilled all their notification requirements in the prescribed manner and form the SEC, after having considered the merger may issue a certificate in the prescribed form approving the merger, approving the merger subject to any conditions; or prohibiting the implementation of the merger. The SEC may extend the period within which it has to consider the proposed merger by a period of no more

than 40 working days. If, upon the expiration of the 20 working days period or of the extension, the SEC has not issued a certificate, the merger shall be deemed to have been approved. The SEC is required to thereafter, publish a notice of the decision; and if it prohibits or conditionally approves the merger, or is requested to do so by a party to the merger, to issue written reasons for the decision.

Section 126 of the ISA requires the SEC, after receiving notice of a large merger, to refer the notice to the court; and within 40 working days after all parties to a large merger have fulfilled all the prescribed notification requirements, to forward to the court a statement indicating, whether implementation of the merger is (i) approved;(ii) approved subject to any conditions; or (iii) prohibited.

SEC Rule 229 provides that the SEC shall only approve a merger where it is satisfied that the merger is not likely to cause substantial restraint of competition or tend to create monopoly in any line of business enterprise; and the use of such shares by voting or granting proxies or otherwise shall not cause substantial "restraint of competition "or" tend to create monopoly in any line of business enterprise or that although the contemplated merger is likely to restrain competition, one of the parties to the merger has proved that it is failing.

In considering a merger, the SEC is required, in accordance with section 121 (1) of the ISA to

a.   Initially determine whether the merger is likely to substantially prevent or lessen competition; and

b.   where it appears that the merger is likely to substantially prevent or lessen competition, then the SEC shall also have to determine -

    i.   whether the merger is likely to result in any technological efficiency or other pro-competitive gain which will be greater than, and off-set, the effects of any prevention or lessening of competition, that may result or is likely to result from the merger, and would not likely be obtained if the merger is prevented, and

    ii.   whether the merger can be justified on substantial public interest grounds.

When determining whether a merger is likely to substantially prevent or lessen competition, the SEC will assess the strength of competition in the relevant market, and the probability that the company, in the market after the merger, will behave competitively or co-operatively, taking into account any factor that is relevant to competition in that market, including:

    i.   The actual and potential level of import competition in the market;

    ii.   The ease of entry into the market, including tariff and regulatory barriers;

    iii.   The level and trends of concentration, and history of collusion, in the market;

    iv.   The degree of countervailing power in the market;

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The dynamic characteristics of the market, including growth, innovation, and product differentiation;
The nature and extent of vertical integration in the market;
Whether the business or part of the business of a party to the merger or proposed merger has failed or is likely to fail; and
Whether the merger will result in the removal of an effective competitor.

In determining whether a merger can be justified on substantial public interest grounds the SEC is required to consider the effect that the merger will have on a particular industrial sector or region; employment; the ability of small businesses to become competitive; and the ability of national industries to compete in international markets.

After its initial determination, the SEC may grant an approval in principle to the merger and direct the merging companies to make an application to the court to order separate meetings of shareholders of the merging companies in order to obtain their concurrence to the proposed merger. If a majority representing not less than three quarters in value (i.e. 75%) of the shares of members being present and voting either in person or by proxy at each of the separate meetings agree to the scheme, the scheme shall be referred to the SEC for approval.

Professional Parties Required

Merger applications must be filed by separate financial advisers that are registered with the SEC as an Issuing House) or by the solicitor for each of the merging companies. In the case of small mergers, a single financial adviser may be used.

Procedure for Obtaining SEC Approval to Mergers:

The procedure for obtaining the approval of the SEC with respect to a merger is set out in SEC Rule 231 as follows:

a. File a merger notice (that is a pre-merger notice) for evaluation with the SEC;

b. Once the SEC has given its "approval-in- principle", file an application in the Federal High Court seeking an order to convene a court ordered meeting;

c. Following the passing of the resolution by the respective shareholders at the court ordered meeting, file an application with the SEC for formal approval of the merger; and

d. Comply with post approval requirements.

In practice, the procedure for carrying out a merger is as follows:

a.   Consideration and approval in principle of the proposed merger by the boards of the merging companies;

b.   Issuance of pre-merger notice to SEC;

c.   Application to the court to sanction the proposed merger and order of the court for separate general meetings of the merging companies;

d.   Obtain a "direction" and "clearance" for the merger from the Federal Inland Revenue Service;

e.   Referral to SEC for approval where the merger scheme is approved by at least three-quarters of the members (either in person or by proxy) of the merging companies at their separate meetings; each merging company will be required to pass a resolution approving the terms of the merger;

f.   Upon approval of the merger scheme by the SEC and members of the merging companies, either company may then apply to the Court to sanction the scheme;

g.   Upon approval by the court: publish the court order sanctioning the scheme in at least one national newspaper, file a copy of the court order with the SEC within 7 days of obtaining the order, and file a copy of the Court order with the Corporate Affairs Commission (the Nigeria companies registry).

The overall approval process (i.e. from submission to the SEC of an application for merger approval, to the sanction of such merger by the Federal High Court) can take anywhere from three to six months.

Section 127 (1) of the ISA provides that the SEC reserves the right to revoke its own decision to approve or conditionally approve a merger of any size on any of the following grounds if the decision was based on incorrect information for which a party to the merger is responsible; the approval was obtained by deceit; or a company concerned in the merger has breached an obligation attached to the decision

Penalties

Although the ISA and SEC Rules do not provide specific penalties on non-notification of a relevant merger, section 303 of the ISA gives the SEC the power to impose a general penalty of not less than =N=100,000 (approximately US$ 645.00) and a further sum of =N=5,000 (approximately US$ 32.00) per day that the violation continues.

If the SEC considers that a transaction raises competition concerns, it can block the transaction or allow it to proceed but subject to conditions. The ISA specifically gives the SEC the power to, in addition to other sanctions, break up a company into smaller entities (and to forward its decision to the Federal High Court for sanctioning - having first written to the company,

reviewed the company's response and if necessary affording senior officers of company opportunities to defend their position) so that its operations will not cause a substantial restraint of competition. Thus, for example, the SEC may allow a transaction to proceed on condition that the parties divest part of their businesses. There is no guidance on whether the SEC could impose other conditions (such as price regulation), although it appears that the SEC has broad discretion with regard to what conditions it imposes.

Other Strategic Considerations

The merger rules do not apply to merger transactions that take place outside Nigeria, even where the merging companies have affiliates or subsidiaries in Nigeria. In addition, the concept of a "hostile" takeover transaction is not recognized under the ISA and the SEC Rules, and no particular rules exist to aid a party in a hostile takeover.

13.12 Quantitative Factors in Mergers and Acquisitions

Every decision a manager or supervisor makes deals with relevant costs and revenues. Managers try to predict what the future costs and the future revenues will be if a certain action is taken or a decision is made. Most managers look at the relevant quantitative factors when making any important decisions.

Quantitative factors are outcomes from certain actions that are measurable in numbers or numeric terms. In other words, managers can quantify the effects of a decision. This could include measuring costs, revenues, or even non-financial data for outcomes to a decision.

Managers often use quantitative factors when deciding whether to buy a new piece of equipment. The quantitative factors of buying a new piece of equipment are both financial and non-financial. For instance, the new machine might use different, less expensive raw materials. This is a financial, quantitative factor because the direct material costs are decreasing because of the new equipment. The non-financial factors involved with purchasing the new machine could be decreased labour hours. Since the machine produces products more efficiently, less labour hours are required to produce the same amount of products. The number of labour hours saved by purchasing the new machine is non-monetary, but it can be measured. The cost savings from the decreased labour hours is, however, a financial benefit.

Quantitative factors aren't the only factors used by management in the decision making process. Most managers also weigh qualitative factors alongside quantitative factors in order to make a strategic decision.

13.13 Review Questions

1.   Discuss merger and the types of mergers you know. (5marks)

2. Distinguish between merger and acquisition, specifying financial benefit of each. (5marks)

3. Assess the actual factors influencing the likelihood of a successful acquisition. (5marks)

4. Evaluate the financial performance of merged companies including reasons for their

   success and failure. (5marks)

5. Appraise is the procedure for carrying out a merger? (5marks)

6. Identify and analyse the factors to be considered in mergers and acquisition? (5marks)

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