BUS 217

BUSINESS FINANCE 1

CHAPTER ONE

THE FUNCTION OF FINANCE AND SCOPE OF FINANCIAL MANAGEMENT

INTRODUCTION

The field of finance is closely allied to the field of economics and accounting. Financial management can be viewed as a form of applied economics that draws heavily on theoretical economic constructs. Financial management also draws certain data from accounting, another area of applied economics. As an introduction, we shall first discuss the relationship between both finance and economics and finance and accounting. Although each of these disciplines are related, there are key differences between them.

FINANCE AND ECONOMICS

The importance of economics to the development of the financial environment and financial theory can best be described in light of the two broad areas of economics-macroeconomics and micro economics. Macroeconomics is concerned with the overall institutional and international environment in which the firm must operate, while microeconomics concerns itself with the determination of optimal operating strategies for firms or individuals. Let us take a brief look at each of these areas, as they relate to financial management.

MACROECONOMICS: It is from the theories of macroeconomics that the financial environment min which the finance function are implemented is established. Macroeconomics is concerned with the institutional structure of banking system, financial intermediaries, the federal treasury and the economic policies available to the federal government for coping with the controlling the level of economic activity within the economy.

Since the business first must operate in the macroeconomic environment, it is important that the financial manager be aware of the institutional framework it contains. He must also be alert to the consequences of varying levels of economic activity and changes in government for coping with and controlling the level of economic activity within the economy.

Since the business firm must operate in the macroeconomic environment, it is important that the financial manager be aware of the institutional framework it contains. He must also be alert to the consequences of varying levels of environment. Without an understanding of the function of the broad economic environment within which he operates, the financial manager cannot hope to achieve financial success for the firm. He must recognize the consequences of a more restrictive monetary policy on the firm's fund raising and revenue generating abilities. He must also be aware of various financial institutions and their mode of operations to be also to evaluate the firm's sources of financing.

MACROECONOMICS: The theories of microeconomics are concerned with the efficient operations of a business firm. They are concerned with defining actions that will permit the firm to achieve financial success. The concepts involved in supply and demand relationships with profit maximizing strategies are drawn from microeconomic theory. Issues related to the mix of productive factor, optimal sales and product pricing strategies are all affected by theories on the microeconomic level. Theories related to the measurement of utility preference, risk and the determination of value are rooted in microeconomic theory. The rationale for depreciating assets is

also derived from the area of economics. Although the financial manager does not apply the theories of microeconomics directly, he should operate in a manner consistent with its general principles.

FINANCE AND ACCOUNTING

Many people view the finance and accounting functions within a business firm as virtually the same. Although there is a close of relationship between these functions, just as there is a close relationship between these economics. The accounting function is best viewed as a necessary input to the finance function, that is as a sub-function of finance. This view is in line with the traditional organization of the activities of a firm into three basic area – finance, management and marketing. The accounting function is typically viewed as within the control of the financial vice president. However, there are two keys differences in view point between finance and accounting-one related to the treatment of funds and the other to decision making.

TREATMENT OF FUNDS

The accountant, whose primary function is to develop and provide data for measuring the performance of the firm and paying taxes, differs from the financial manager in the way he views the firm's funds. The accountant, using certain standardized and generally accepted principles prepares financial statements based on the premise that revenue should be recognize at the point of sales and expenses when they are incurred. This method of accounting is commonly referred to as the accrual system, revenues resulting from the sale of merchandise on credit, for which the actual cash payment has not yet been received appear on the firms financial statements as accounts receivable. Any temporary asset expenses are treated in a similar fashion; that is certain liabilities are established to represent goods or services which have been received but are yet to be paid for. These items are usually listed on the balance sheet as accounts payable, or accruals.

The financial manager is more concerned with maintaining a firms solvency by providing the cash flows necessary to satisfy its obligations and acquiring the current and fixed assets needed to achieve the firms goals. Instead of recognizing revenue at the point of sales and expenses when incurred, as the accountant does, he recognizes revenues and expenses only with respect to inflows or outflows of cash.

A simple analogy may help to clarify the basic difference in view points between the accountant and the financial manager. If one looked on the human body as a business firm in which each pulsation of the heart represented a new sale, the accountant will concern himself with each of these pulsations and enter whether the resulting flow of blood through the arteries reached the right cells and kept the various organs of the body functioning. It is possible for a body to have strong heart but cease to function due to the development of blockages or clots in the circulatory system. Similarly, a business firm may have increasing levels of sales but still fails because it ha an insufficient inflow of cash to pay its bills.

Example

Mr. MIFO who is Ice Cream Business, sold his Ice Cream, which he produced at 75 kobo, for 1N, he extend credit to his customers and required payment within 30 days of the date of sale. He based his level of production in each period on his estimates of the following period sales. These estimates, which were quite accurate, indicated a steady increase in sales over the next three

months. Mr MIFO was quite fortunate in that his customers always paid their accounts within 30 days credit period.

The following events occurred during the period of January 1 – April 1

Jan. 1	Cash	N750
	Inventory	N1,125
	Receivables	N1,500

During January he sold 2,000 Ice Creams and produced 2,500 more in order to have a 30 days supply as inventory. His p1rofits were N500 (.25 x 2000 units).

Feb. 1	Cash	N375
	Inventory	N1,500
	Receivables	N2,000

During March, sales increased to 2,500 unit and production increased to 3,000 units. Mr. MIFO's profit for the period were N625 (.25 x 2,500 units). His profits to date were N1,125

March 1	Cash	N125
	Inventory	N1,875
	Receivables	N2,500

During March, sales increased to 3,000 units and production to 3,500. This time Mr. MIFO's profits for the period were N750 (.25 x 3,500 units). His profits to date were N1875.

April 1	Cash	N0.00
	Inventory	N250
	Receivables	N3, 000

On April 1, Mr. MIFO was out of cash and was therefore unable to produce more Ice Cream, despite the profits he had recorded in all the preceding periods. The lesion of the above examples is that accounting data does not fully describe the financial circumstances of a firm. The financial manager must look beyond his company's financial statement in order to obtain insight into developing or existing problems in its financial positions. Mr. MIFO's cash shortage resulted from the rapid receivable he required to support his growing levels of sales. He should have planned ahead to obtain financing, although he probably could obtain the needed funds on short notice due to his proven profitability.

DECISION MAKING

The duties of the financial manager differ from those of the accountant in that the accountant devotes the majority of his attention to the collection and presentation of financial data. The financial manager evaluates the accountant's statement, develops additional data and makes decisions based on his analyses. The accountant's role is to provide consistently developed and easily interpreted data on the firm's past, present and possibly, future operations. The financial manager uses this data either in raw form or after making certain adjustments and analyses, as an important input to the financial decision making process. Of course, this does not mean that accounts never make decisions and financial managers never gather data; rather the primary emphasis of accounting and finance is on the functions we have indicated.

THE FUNCTION OF FINANCE

Financial management is defined by the functions and areas of responsibilities of financial managers, while the specifics vary among individual organizations, some finance task are basic.
The financial managers' main function is to plan for, obtain and use funds to maximize the value of a firm (value is represented by the market price of the company's common stock, which in turn is a reflection of the firm's investment, financing and divided decisions). In short, the financial manager makes decisions on alternative sources and uses of funds. This definition involves several important activities.

1. In planning and forecasting the financial manager must look ahead and interact with the executives who are responsible for the general planning activities of the firm.
2. A financial manager is concern with investment and financing decisions and their interactions. A successful firm usually achieves a high rate of growth in sales, which requires the support of increased investment by the firms. Financial managers must determine a sound rate of sales growth and must rank alternative investment opportunities. They help decide on the specific investment to be made and the alternative sources and forms of funds for financing these investments. Decision must be made about the use of internal versus external funds, the use of debt versus owner's funds; the use of long term versus short term financing. This function can be referred to as determining the financial side of the firms' balance sheet.
3. *Determining the firm's asset:* The financial manager determines both the mix and the types of assets found on the firms' balance sheet. The mix refers to the number if naira of current and fixed assets. Once the mix is determine, the financial manager must determine and attempt to maintain certain optimal levels of each type of current asset. He must also determine which the best fixed assets to acquire are. He must know when existing fixed assets becomes obsolete and need to be replaced or modified. The determination of the best asset structure for the firm is not a simple process; it requires insight into the past and future operations of the firm and an understanding of its long run objectives.
4. The firm manager interacts with other parts of the business to help the firm operate as efficiently as possible. All business decisions have financial implications and all managers – financial and otherwise need to take this into account. For example marketing will affect sales growth which changes investment requirements. Thus marketing decisions needs to take into account how they affect (and are affected by) the availability of funds, inventory policies, plant capacity utilization etc
5. *The use of Money and capital Market:* the financial manager links his firm to the financial markets in which funds are raised and in which the firm's securities are traded.
6. *Analyzing financial data:* This function is concerned with the transformation of financial data into a form that can be used to monitor the firm's financial and to evaluate the need for increased production capacity and to determine what additional financing is required. Proper performance of this function is necessary if the financial manager is to carry out his other key functions of determining the firm's asset and financial venture

In sum, the central responsibilities of financial managers relate to decisions on investments and how they are financed, in the performance of these functions, the financial managers' responsibilities have a direct bearing on the key decisions affecting the value of the firm.

SCOPE OF FINANCIAL MANAGEMENT

The three important activities of the business firm are finance production and marketing. The firm sources capital it needs and employs it (finance activity) and generates returns on the invested capital (production and marketing activities)

The firm acquires funds from the sources called investors, the funds so secured when invested, are called investments. The firm expects to receive returns on investment over time and these processes are not in fact, sequential, they are performed simultaneously and continuously,

The raising of capital funds and using them for generating returns and paying returns to the suppliers of funds are called the finance functions of the firm. There are two types of funds that a firm raises: equity funds and borrowed funds. A firm has to sell shares to acquire equity funds. Share represents ownership rights of their holders. The buyers of shares are called shareholders and are the legal owners of the firm whose share they hold. Shareholders invest their money in the shares of a company in the expectation of returns on their invested capital. The return on the shareholder's capital is called dividend.

Shareholders can be of two types. Common and preference. Preference shareholders receive dividend at a fixed rate and have a priority over common shareholders in receiving dividends.

The dividends rate for common shareholders is not fixed and can only vary from year to year depending on the decision of the board of directors.

Another important source of securing capital is through creditors or lenders. Lenders are not owners of the company. They make money available to the firm on lending basis and retain title to the fund lent.

The return on loans or borrowed funds is called interest.

A company can also secure funds by retaining a portion of the returns available for shareholders. This method of acquiring fund is called retaining earnings. The retained earnings are undistributed returns on equity capital; they are therefore rightfully a part of equity capital.

The retention of earning can be considered as a form of raising new capital. If a company distributes all earning to shareholders, then it can re-acquire new capital from the same source by issuing new shares

The fund raised by a company will be invested in the available investment opportunities. Each investment opportunity available to a company is called investment project or simply a project. It would be realized that generation of revenue of a production activity is possible only when funds are invested in projects.

There exists an inseparable relationship between the finance function on the one hand and the production, marketing and other functions on the other. Almost all kinds of business activity directly or indirectly involve the acquisition and use of money. For example, recruitment and promotion of employees in production department, but recruitment and promotion of employees requires payment of wages and salaries and other benefits and thus involves finance. Similarly buying a new machine or replacing an old machine for the purpose of increasing productive capacity affects the flow of funds. The sales promotion policies come within the area of marketing, but advertising and other sales promotion activities requires outlays of cash, and therefore affect financial resources.

Although it may be difficult to separate the finance function from production marketing and other functions, yet the functions themselves can be readily identified. We may identify two kinds of finance functions.

1. Managerial finance functions
2. Routine finance functions

Managerial finance function are so called because they require skillful planning, control and execution of financial activities. Routine finance functions, on the other hand, do not require a great managerial ability to carry them out. They are chiefly clerical and are incidental to the effective handling of the managerial functions.

The three important managerial finance functions are: investment (or asset mix) decisions: financing (or capital mix) decision and dividend (or profit allocation decision). These financial decisions directly concern the firm's decision or disposal of assets and require the commitment or re-commitment of funds on a contentious basis. It is in this context that finance functions are sound to influence production, marketing and other functions of the firm. This in consequence will affect the size, growth, profitability and risk of the firm and ultimately the value of the firm. To quote Ezra Solomon "the function of financial management is to review and control decisions to commit or recommit funds to new or on going uses. Thus in addition, to raising funds, financial management is directly concerned with production, marketing and other functions within an enterprise whenever decisions are made about the acquisition or distribution of assets.

For the effective execution of the managerial finance functions, the incidental or routine functions have to be performed. These decisions concern the procedures and involve lot of paper work and time. Some of the important routine finance functions are:

(i) Supervision of cash receipts and payments and the safeguarding of cash balance.
(ii) Custody and safeguarding of securities, insurance policies and other valuable papers.
(iii) Taking care of the mechanical details of new outside financing.
(iv) Record keeping and reporting

The chief finance executive in the modern enterprises is mainly involved in the managerial finance functions; the routine finance functions are carried out by the people at lower levels. His involvement in the routine finance functions is to the extent of setting up rules of procedure, selecting forms to be used establishing standards for the employments of competent personnel and to check up the performance to see that the rules are observed and the forms properly used.

CHAPTER TWO

FORMS OF BUSINESS ORGANIZATION

The three basic forms of business organization are:

1. Sole proprietorship
2. Partnership
3. Corporations

1. Sole Proprietor

The oldest type of business unit is that of the sole proprietor the "one man" business. The Sole Proprietorship is a business which is owned by one person who operates it for his own profit. In essence, the sole proprietor is self employed; the typical sole proprietorship is a small fir, such as "Banadeen Stores", Bogobiri Kiosk", auto repair shop or shoe repair business. Most often the proprietor, along with a few employees (who may be members of his family) operates the proprietorship. Its other characteristics are:

i. The financial and other risks associated with the business are all borne by the sole owner
ii. The capital of the business is provided by the owner, though to make a start he may have to borrow from friends or relations.
iii. The owners shoulders the entire responsibility for the management and operation of the business.

The majority of the sole proprietorship business in Nigeria are in the wholesale, retail or service industries

Advantages of Sole Proprietorship

The commonly cited advantage of a sole proprietorship aside from being one's boss are as follows: It is easily and inexpensively formed i.e no formal charter for operation is required and it is subject to only a few government regulations.

1. Self-interest is a powerful motive making for the success of the one man business. He has every incentive to make his business as efficient as possible. He is in full charge and can devote as much as of his time and energy to its as he wishes
2. There is freedom of taking any action or decision in this type of business.
3. It pays no corporate income taxes although all earnings are subject to personal income taxes
4. Ownership of all profits goes to the sole proprietor. Many people do not like the idea of working for someone else and seeing their employer receives the profit of their efforts. The sole proprietorship allows the owner to receive the fruits of his effort.

Disadvantages of a Sole Proprietorship

The following disadvantages of this type of business may be noted:

1. The smallness of the capital may hinder expansion
2. Lack of continuity when the proprietor dies. The personal abilities of the sole proprietor determined the success of the business and on his death or retirement continued success depend on the ability of the person who inherits the business, as there is no assurance that his successor will posses the necessary ability.

3. Unlimited Liability: The Sole proprietor bears all the risk of the business and thus personally liable for all the debts and obligations of the firm. He cannot, for example limit his liability to the capital he has invested in the business.
4. This type of business is unsuitable for any form of production where economics of scales are available
5. Lack of opportunity for employee, since, normally, long run incentive for a good employee to stay in the firm's employment cannot be guaranteed.

2. Partnership

When two or more person associated to conduct business for the purpose of making profit, a partnership is said to exist. Most partnerships are established by a written contract between the partners known as the Article of Partnership" the articles of partnership generally include (1) provisions for salaries (2) a description of how profits and losses are to be divided and (3) the procedure to be followed if a partner withdraws from the business or the firm is dissolved.

1. **Limited Partnership:** The most common of the special types of partnership is the limited partnership. In a general or regular partnership all the partners have unlimited liability; that is, their personal assets can be claimed when the firm defaults on its obligations. In a limited partnership one or more partners can be designated as having limited liability as long as, at least one partner has unlimited liability. The limited partner is normally prohibited from being active in the management of the firm. The advantage of limited partnership is that an individual can invest money and expect a return without assuming any liability beyond the amount of his investment.

Advantages of Partnership

1. The financial resources of more than one person provides higher amount of capital.
2. Like the sole proprietorship, it is easy and economical to form.
3. There is a very limited amount of government control
4. There is the benefit of combined judgment.

Disadvantages of Partnership

1. Limited Life: When a partner dies or withdraws from the business the partnership is dissolved.
2. Unlimited Liability: Each of the general partners is liable for the partnerships debts i.e. subject to joint and several liability.
3. It is difficult for a partner to liquidate or transfer money invested in the partnership.
4. The partnership, although it can grow to a larger size than a sole proprietorship, still has difficulty in achieving large scale operations.

CORPORATION

A corporation is a large entity created by the state. According to Justice Marshall, a former Chief Justice of the U.S.A a corporation is an artificial being, invisible, intangible and existing only in the contemplation of the law. This type of business is a legal entity distinct from its owners and managers.

CHARACTERISTICS OF A CORPORATION

1. It is a legal entity separate from its owner i.e it may be sue or be sued by another person including the owners
2. It is normally given a charter which states the purpose of a corporation and the general limitation within which the firm may operate
3. It has an unlimited life, though ownership composition may continue to change.
4. Ownership belongs to the stock (stock) holders and can be transferred without the necessity of obtaining permission from other stock (shareholders)
5. It is subject to a variety of taxes
6. The corporate officers are responsible for the day to day operation of the firm.
7. The Board of Director is responsible for directing the affaires of the business and final authority rests with them.

ADVANTAGES OF A CORPORATION

1. The liability of the shareholders is limited to the fully paid up value of the share he holds, so that if the company should find itself in difficulties and unable to meet the demands of its creditors, the shareholders can lose more than the amount he has invested in the business.
2. Since the maximum possible loss is known in advance shares are readily marketable and can be raised from any individuals through the sales stock
3. Transfer of ownership can easily be affected through organized stock exchange.
4. The company has perpetual life span. The death or withdrawal of an owner does not liquidate the company
5. The expenses involve in the process of incorporation are enormous. Government regulations and controls. Since the corporation is a legal entity (being) it is subject to regulation by various state and Federal government departments. Often, more paper work and information gathering is required in order to fulfill the requirements of these regulatory agencies.

CHAPTER THREE

ANALYZING FINANCIAL PERFORMANCE

I t is often useful to develop certain financial statements as an aid in evaluating a firm's past or present performance. The sources and uses of fund statements allow the financial manager to analyze the firm's historical sources and uses of funds. This statement is often called a sources and application of funds statement.

SOURCES AND USES OF FUNDS

The sources and uses of funds statement helps to provide answers to the following questions (which the bank manager will ask when a firm requests a loan): what has the firm done with the money it had? What will it do with the new funds? How will it repay the loan? It also provides answers to questions that other interested parties may have about the firm. This information may indicate that the firm is making progress or that problems are arising. By sources and uses analysis, we can determine over any period where a firm obtain its funds and what it did with them.

SOURCE AND USE OF FUNDS STATEMENTS

The term funds can be defined to mean either of two things cash or networking capital. Both these items are necessary for the firm to function effectively. Cash is needed for the firm to pay bills. Net working capital is necessary especially in seasonal businesses to provide a financial cushion for the payment of bills due in the near future. The use of net working capital in the development of the source and use of funds statement is based on the belief that current assets, which by definition can be converted into cash in a short period of time as well as cash can be utilized to pay the firm's current liabilities. The source and use of cash statement provides much more detailed information than the source and use of net working capital statements.

1. Using cash to purchase inventors or,
2. Putting the cash in its bank account. The action will consume cash, but the purchase of inventory will convert it into another type of asset, whereas the placement of cash in the firm’s bank account will not.

Both actions will increase the firm’s assets and therefore must be considered uses of cash.

Net Losses: If a firm were to experience a net loss, this would result in a use of funds. It is possible for a firm to have a net loss but still have possible cash flows from operation if depreciation in the same period is greater than the net loss.

Assets and Liabilities: Except for cases described above, increases in assets are uses of funds and decreases in assets are source of funds. It takes cash to increase asset, and cash is generated through the sales of a fixed assets or the collection in liabilities are uses of funds. An increase in a liability represents increase in financing, which is expected to generate funds. While decrease in a liability represent the repayments of a debt, which requires a cash outlay.

One other point to note is that no direct stockholder’s equity entries have been classified as sources or uses of funds; instead entries for items that mat affect the firms stockholders equity have appeared as net profit or losses after taxes, cash dividend and the results of the sale or repurchase of stock. How these items are treated as non-actual source and use of funds statement will be described later.

Special Adjustment

A number of special adjustments are often required in making up a source and use of funds statement. Each of these adjustments stem from the nature of the financial statements used. The inputs required for preparing a sources and use of funds statement are (1) an income statement for the most recent period (2) a balance sheet for the most recent period and (3) a balance sheet for the earlier period being used as a basis for comparison. Adjustments can be expected relating to the following items.

Changes in Fixed Assets:

Of all the firm's assets, only fixed assets required special attention. This is because there are two ways in which fixed assets may be shown on the balance sheet. The first way is more detailed and does not require any special attention. Assume that a firm has the following fixed assets entries on its balance sheet and that depreciation of ₦500 is shown on the income statement for 2001.

	2000	**2001**
Fixed Assets	₦9,500	₦10,200
Less Accumulated Depreciation	₦4,200	₦4,700
Net Fixed Assets	₦5,300	₦5,500

In this case, the change in the firm's fixed assets is ₦700, this figure is easily obtained by taking the difference between the fixed assets form the current year (2001) and those for the preceding year (2000) (₦10,200-₦9,500). The change in fixed assets of N700 will appear as a use of fund on the firm's source and use statement. The difference between accumulated deprecation in 2000 and 2001 (₦500) is equal to the depreciation expenses on the firm's income statement.

The less detailed way of showing a firm's fixed assets on the balance sheet, which is much more common, is to show only "net fixed assets" assumed that a firm has the net fixed assets indicated below and that ₦500 in depreciation was written off on its 2001 income statement.

	2000	2001
Net Fixed Assets	₦5,300	₦5,500

To find the change (if any) in the firm's fixed assets when one is given this type of data, the following formula is used:

$\Delta FA_t = NFA_t + Dept._t - NFA_{t-1}$

Where:

ΔFA_t = The change in fixed assets in the current period

NFA_t = The net fixed assets in the current period

$Dept_t$ = The depreciation written off in the current period.t

NFA_{t-1} = The net fixed assets in the preceding $period_{t-1}$

Applying Equation (1) to the data given above yields

ΔFA_t = ₦5,500 + ₦500 – ₦5,300 = ₦700.00

The result is the same as in the first case, but it has been obtained in an indirect fashion.

If the application of Equation (1) to the firm's financial statements results in a negative change in fixed assets, the amount of this decease is entered as a source of funds in the sources and use of

funds statement. If a change of zero in the firm's fixed assets results, no entry is made on its source and use of funds statement, this occurs when the firm's fixed assets increase by an amount just equal to the depreciation for the period.

DIVIDENDS: Occasionally the firm's cash dividend payments are shown on the income statement. If they are of course, they are readily available to be entered on the source and use of funds statement. However in many instances the last item shown on the firm's income statement is net profits after taxes. In this case the analyst should investigate further to determine whether any cash dividends were paid. Assume that a firm shows net profits after taxes of ₦5,000 for the current year (2001) and that the stockholders equity for the past year (2000) and the current year (2001) is as follows:

	2000	**2001**
Common Stock	₦40,000	₦45,000
Retained Earnings	₦30,000	₦33,000
Total	₦70,000	₦78,000

In this case, the firm's retained earnings have increased by ₦3,000 (₦33,000 - ₦30,000). This increase accounts for the disposition of only ₦3,000 of the ₦5,000 of net profits after taxes. The remaining ₦2,000 must therefore represents a dividend payment of ₦2,000. This dividend payment is a use of funds by the firm. Equation (2) can be used to calculate the amount of cash dividends paid when they are not shown on the firm's income statement.

$Div_t = NPAT_t – RE_t + RE_{t-1}$

Where:

Div_t	=	The cash dividend paid in the period
$NPAT_t$	=	The net profit after taxes in the period
RE_t	=	The retained earnings at the end of the current period.
RE_{t-1}	=	The retained earnings at the end of the $period_{t-1}$

Substituting the data above into Equation (2) yields

DIVt = ₦5,000 – ₦33,000 + ₦30,000 = ₦2,000

If the firms retained earnings have increased by an amount just equal to its net profits after taxes, it must have paid on dividends. In this case, no entry on the source and use of funds statements is required.

STOCKS

A firm may sell additional stock, retire existing shares, or repurchase outstanding shares. It may take these actions with regard to both preferred and common stock. Preferred stock is not most likely to be retired since it quite often has a call feature which allows the issuer to buy back shares in the future. In the case of both common and preferred stock, the amount purchased or sold can be determined by calculating the changes in its stock. An increaser in stock is a source of funds, while a decrease is a use of funds. In the above example, the firm's common stock increase from ₦40,000 in 2000 to ₦45,000 in 2001. This increase of ₦5,000 in common stock represents a sale of stock, which is shown as a source of funds on the firm's source and use of funds statement.

The following formula can be used to evaluate whether a sale or purchase of stock has occurred.

$\Delta Stock_t = SE_t - SE_{t-1} - RE_t + RE_{t-1}$

Where:

ΔStock	=	the change (if any) in the firm's stock outstanding
SE_t	=	the firm's stockholders equity in period $_t$
SE_{t-1}	=	the firm's stockholders equity in period $_{t-1}$
RE_t	=	are defined as before

Although Equation (3), may look difficult, it merely represents the calculations described above. Applying equation (3) to the figures given in the above example yields:

$\Delta Stock_t$ = N78,000 – N70,000 – N33,000 + N30,000 = N5,000. The N5,000 increase in stock will be shown as a source of funds of 5,000 on the source and use statement. If the firm were to repurchase or retire stock, a negative value would result that would be shown as a use of funds. If there were no change in the firm's stock outstanding, no entry would be required on the source and use of funds statement.

PREPARATION OF A SOURCE AND USE STATEMENT

The simplified financial statements below are used to illustrate the actual application of the adjustments discussed above to the preparation of source and use statements.

Financial statement of the Mifo Company

Balance sheets

Assets	**2000**	**2001**
Cash	300	N400
Marketable securities	200	600
Accounts receivable	500	400
Inventory	800	500
Prepaid items	100	100
Total current asset	N 1,900	N2,000
Net fixed assets	1,900	1,200
Total Assets	2,900	3,200
Liabilities and stakeholders equality		
Accounts payable	500	600
Notes payable	700	400
Taxes payable	200	200
Accruals	0	400
Total current liabilities	N1400	N1600
Long term dept	N400	N600
Preferred stock	100	100
Common stock	500	300
Retainedearning	500	600
Total stakeholders equity	N1, 900	N1, 000

Total liabilities & stock Holder's equity	N2, 900	N3, 200

Income statement	**1981**
Sales	N1, 000
Less cost of goods sold	500
Gross profits	500
Less expenses:	100
General & Admin Expenses	100
Depreciation	200
Profit before taxes	300
Less taxes	150
Profit after taxes	150

Several steps are involved in constructing a source and use statement.

Step 1: using the earliest time period base, calculate the balance sheet changes in all items. Classify the balance sheet changes in all items, except fixed assets and retained earnings as either a soured (s) or a use (u) Note that fixed assets and retained earnings are not classified as sources or uses because a direct entry of these items on the source and use statement is not normally required.
Step 2: calculate the change in MIFO company's fixed assets using equation (1)
Change in assets.N1, 200+N100-N1, 000=N300
Since the firm's fixed assets have increased, use of funds of N300 results.
Step 3: calculate the cash dividend paid, if they are not shown the income statement, using equation (2):
Dividends = N150 – N600 + N500 = N50. This amount is entered as a use of funds on the source and use of funds statement.
Step (4): calculate the change, if any, in the amount of stock outstanding using equation (3) is suggested.

A classification of balance sheet changes for MIFO Company as sources (S) or uses (U) of funds:

Item	**changes (N)**	**classification**
Cash	+100	U
Marketable securities	+400	U
Accounts receivables	-100	S
Inventory	-300	S
Prepaid items	-	-
Net fixed Assets	+200	-
Account payable	+100	S
Notes payable	-300	U
Taxes payable	-	-
Accruals	+400	S
Long term dept	+200	S
Preferred stock	-	-
Common stock	-200	U
Retain earnings	+100	-

A source and use of statement for the Mifo Company:

Source		Uses	
Net profit after tax	N150	Dividends	N50
Depreciation	100	Increase in fixed assets	300
Decrease in accounts Receivable	100	Increase in cash	100
Decrease in inventory	100	Increase in marketable Securities	400
Increase in inventory Payable	100	Decrease in notes payable	300
Increase in accruals	400	Repurchases of stock	200
Increase in long Term	200	total sources	N1, 350
Total uses	N1, 350		

Points to Note:

1. "Total sources" and "Total uses" should be equal if they are not the analyst must have made an error.
2. Net profit after taxes are normally the first source listed and dividend are normally the first use. Ordering items on the sources and use of cash state this way makes it easy to calculate the change in firm's retained earnings.
3. Depreciation and increase in fixed assets are shown seconds to make it easy to compare them. Placing depreciation below net profit after taxes also make the firm cash flow from operations easily calculable.
4. The order of the remaining sources and uses of cash does not matter; the only requirement is that source appears on left side of the statement and uses on the right side.
5. The net change in firm stakeholders' equity can be calculated by adding any sales of stock or subtracting any profits after taxes and cash dividend. For Mifo company, the change in stakeholders' equity is N100 (N150-N50-N200).

Constructing the Source and Use of Net Working Capital Statement

The source and use of net working capital statement is quite similar to the source and use of cash statement, except that the changes in current assets and current liabilities are not entered separately instead, they are combined into a single entry the change in net working capital. Many people prefer the source and use of net working capital statement to the source and use of cash statement because they believe the spontaneous nature of the firms current accounts make their inclusion pointless. These people are more concerned with the net change in a firm's liquidity as measured by its net working capital the firm's current assets, current liabilities, net working capital and change in net working capital are as given below:

The change in net working capital for the Mifo Company:

	2000	**2001**
Total current assets	₦1,900	₦2,000
Total current liabilities	₦1,400	₦1,600
Net working capital	₦500	₦400
Change in net work8ing capital	₦100	

The Mifo Company experienced a ₦100 decrease in net working capital between 2000 and 2001. A decrease in net working capital is a source of funds whereas an increase in net working capital is a use of funds. Since Mifo Company's current assets increased by less than its current liabilities, the net result was a source of funds.

The increase in current asset which was a use of funds was over powered by the increase in current liabilities a source of funds presented below is a source and use of net working capital statement for the Mifo Company. Some authors refer to this simply as a source and use of working capital statement.

Source		**Uses**	
Net profit after taxes	N150	Dividend	N50
Depreciation	100	Increase in fixed assets	300
Decrease in net Working capital	100	Repurchasing of stock	200
Increase in long-Term dept	200	Total source	500
Total uses	550		

The only noticeable difference between the source and use of net working capital statement and the source and use of cash statement is that the current asset and liabilities entries have been replaced by a single entry, the change in net working capital. The balancing figures differ in two types of source and use statement, but this does have any significance for decision making.

INTERPRETING SOURCE AND USE STATEMENT

Source and use of cash and source and use of net working capital statement allow the financial manager to analyses the firm's past and possibly its future fund flows. He will give special attention to the major sources and uses in order to determine from whether any development have occurred that are contrary to firm's financial policies. Although specific casual relations between sources and uses cannot be determining from an analysis of these statements, they do not point out certain types of inefficiencies. For example, large increase in inventory or account receivable may signal the existence of certain type of credit or inventory problem. Problems or symptoms of developing problem can be recognized and investigation into these problems initiated as a result of the analysis of source and use statements.

Analysis of the Mifo Company's source and use state does not seem to indicate the existence of any problems. The sources of funds seem to be distributed in a manner consistent with prudent financial management the same is true of the firm's uses of funds. Analysis of the source and use of cash statement seems to indicate great strength on the part of the firm. The majority of its funds were generated by decreasing inventory and increasing accruals. Both these strategies are consistent with efficient financial management. The major uses of fund were an increase in fixed assets, an increase in marketable securities, and a decrease in notes payable. Each of these items indicates financial strength.

As indicated earlier, the financial manager may apply source and use analysis to projected financial statement in order to determine whether a proposed financial plan is feasible in the sense that the financing required to support the projected level of operation will be available.

REVISION QUESTIONS

1. Given the following financial statement for the SIKAH company prepare a source and of cash statement. Interpret the results.

Balance sheet of SIKAH company limited

	2000	**2001**
Cash	N15, 000	N14,000
Marketing securities	6,000	6,200
Accounts receivable	42,000	33,000
Inventory	51,000	84,000
Prepaid rent	1,200	1,100
Total current assets	115,200	138.300
Net plan and equipment	286,000	270,000
Total assets	401,200	408,300
Liabilities and Stockholders Equity:		
Account payable	48,000	57,000
Note payable	15,000	13,000
Accruals	6,000	5,000
Total current liabilities	N69, 000	N75, 000
Long term debt	160,000	150,000
Stockholder's equity	172,000	183,300
Total liabilities & equity	401,200	408,300

Income statement of SIKAH Company limited

	2011
Sales	N600, 000
Less cost of good sold	460,000
Gross profits	140,000
Less expensive	
General & administrative	40,000
Depreciation	30,000
Total	70,000
Profit before taxes	70,000
Less: taxes	27,100
Profit after taxes	42,900
Less: cash dividend	20,000
Total retained earnings	N22,900

REVISING QUESTION:

1. What is meant by source of cash? What are the basis sources of cash for typical firm?
2. Why are depreciation and non-cash charges considered sources of cash to the firm?
3. What is meant by a use of cash? What are the basis uses of cash for the typical business firm?
4. Classify the following items as a source or uses of funds or as neither by placing an S, a U, or an N next to them:

Item	**Change (N)**
Cash	-400
Accounts payable	+1,000
Notes payable	-500
Long term debt	+2,000
Inventory	-200
Fixed assets	-400
Accounts receivable	+700
Net profits	-600
Deprecation	-
Repurchase of stock	600
Cash dividend	800
Sales of stock	1,000

5. Given the following balance sheet and income statement data, prepare a source and of cash statement for the Mifo company. Interpret your result.

Assets	**1990**	**1991**
Cash	N1,200	N1800
Market securities	2,000	2,500
Inventory	3,600	3,900
Total current assets	8,800	8,200
Net plan & equipment	14,000	14,000
Total	N20,800	N23,000
Liabilities and stockholders equity		
Accounts payable	N1,000	N1,600
Notes payable	2,000	3,000
Total current liabilities	3,000	4,600
Long term dept	5,000	5,000
Common dept	10,000	10,000
Retained earnings	2,800	3,400
Total	**N23,800**	**N23,000**
Additional data:		
Depreciation	N1,600	
Earnings after taxes	N1,400	

6. Using the data in the last question, prepare a source and use of net working capital statement for the SIKAH Company. Interpret the results.

RATION ANALYSIS

The use of financial ratio

Financial analysis is the process of identifying the financial strengths and weakness of the firm by properly establishing relationship between the items of balance sheet and the profit and loss account. The analysis of financial statement is typically devoted to the calculation of ratios in order to evaluate the past, current and projected performance of the business firm. Ratio analysis is the most common form of financial analysis. It provides relative measures of the company's performance.

The basis inputs to financial analysis are the firm's income statement and balance sheet for the period to be examined. Using the data provided by these statements various ratios can be that Permit an evolution of certain aspect of the firm's performance. Ratio analysis of a firm's financial statement is of interest to a number of parties, especially current and prospective shareholders (investor), creditors and the firm's own management. The nature of analysis will differ depending on the purpose of the analyst. For example, the current and prospective shareholder is interested primarily in the firm's present and projected level of earnings. Although the shareholders main concern is with profitability, he also pays close attention to measures of liquidity and leverage in order to determine the likelihood of firm's continued existence and to evaluate the probability of receiving any distribution of firm's earnings. The investors restore more confidence in those firm's earnings. The investors restore more confidence in those firms' that show steady growth earnings.

The firm's creditors are primarily in both short term liquidity of the firm and the ability of the firm to service its dept over the long run. Existing creditors want to assure themselves that the firm is liquid and that it will be able to make its interest and principal payment when due. Prospective creditors are concerned with determining whether the firm can support the additional dept that would result if they extent credit to firm's. A secondary interest of the present or prospective creator are concerned with determining whether the firm can support the additional debt that would result if they extent credit to firm. A secondary interest of the present or prospective creditor is the firm's profitability; he want to assure himself that the firm is healthy and will continue to e successful. Trade creditors (short term creditors) are interested in fact that the firm should be able to meet claims over a very short period of time. Their analysis will therefore confine to the evaluation of firm's liquidity position. The suppliers of long term debt, on the other hand are interested in the firm's long term solvency and survival. They analyze the firm's profitability over time, its ability to generate cash to be able to pay interest and return their claim and the relationship between various sources of fund (capital structure relationship). Long term creditors do not only analyze the historical financial statements, but require the firm supply projected or perform financial statements, to make analysis about the firm's solvency and profitability.

The firm's management is concerned with all aspect of firm's financial situation. Since it is aware of type of the type of things evaluated by owners and creditors, it attempts to operate in manner that will in ratios which will be considered favorable by both parties. It is their overall responsibility to see that the resources of the firm are used most effectively, and efficiently, and that the firm's financial condition is sound. If the firm is successful its credit worthiness should be maintained at a reasonably high level. A collateral objective of the firm's management is to use ratio in order to monitor the firm's performance from period to period. Any unexpected changes are examined in order to isolate developing problems.

Financial analysis provide the manager with the tools necessary to continuously check the pulse of the firm in order to implement corrective programmes as soon as symptoms of future problems are found.

STANDARD OF COMPARISON

The ratio analysis involves comparison for a useful interpretation of the financial statement. A single ratio in itself does not indicate favorable or unfavorable conditions. It should be compared with some standards.

Standards of comparison may consist of:

1. Ratios calculated from the past financial statement of the same firm.
2. Ratios developed using the projected or proforma financial statement the same firm.
3. Ratio of some selected firms, especially the most progressive and successful at the same point in time.
4. Ration of the industry to which the firm belongs.

TYPES OF COMPARISON

There are two basic ways in which financial ratios are used:

1. In a cross sectional approach and
2. In time series analysis

1. *The cross sectional approach* involves the comparison of different firms financial ratios at the same point in time. The typical business firm is interested in how it has performed in relation to its competitors. If the competitors are also corporation, then their financial statement should be available for analysis. Often the firm's performance will be compared to that of that of the industry leader.

This comparison may allow the firm to uncover major operating difference which if change will increase its efficiency. Another very popular type of cross sectional comparison is to compare the firm's ratios to industry averages.

2. *Time series analysis* is done when the financial analyst measures a firm's performance over time. Comparison of the firm's current performance to past performance utilizing ratio analysis allow the firm to determine whether it is progressing as planned. Developing trends can be seen by using multi-year comparison; knowledge of these trends should assist the firm in planning future operations.

The theory behind time series analysis is that the firm must be evaluated in relation to its past performance any developing trends must be isolated, and appropriate action must be taken to direct the firm towards its immediate and long term goals. Time series analysis is often helpful in checking the reasonable of a firm's projected financial statements. A comparison of current and past statements may reveal discrepancies or over optimism in the proforma statements.

Below we discuss specific ratios. You should note the followings:

1. A single ratio does not generally provide sufficient information to judge the overall performance of the firm; only when a group of ratios is used can reasonable judgment concerning the firm's overall financial statement be made.
2. Finally, it is important to make sure that the data in the financial statements being compared have developed in the same way.

TYPES OF RATIOS

It is useful to classify ratios into four fundamental types

1. **Liquidity ratios**: Which measures the firm's ability to meet its maturing short term obligations ? Two commonly used liquidity ratios are:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current Liabilities}}$$

The current ratio is the most commonly used measure of short term solvency, since it indicates the extent to which the claims of short term creditor are covered by assets that are expected to be converted to cash in a period roughly corresponding to the maturity of the claims.

Interpretations: A relatively high value of the current ratio is considered as an indication that the firm is liquid and has the ability to play its bills. On the other hand, relatively low value of the current ratio is considered as an indication that the firm will find it difficult in paying its bills. As a conventional rule, current ratios of 2 to 1 (current assets twice of current liabilities) or more is considered to be satisfactory.

(ii). The Acid test (Quick) ratio: The acid test ratio is similar to the current ratio except for the fact that it excludes inventory from the firm's current assets. The basic assumption of the acid test ratio is that inventory is generally the least liquid current asset and should therefore be ignored. An asset is liquid, if it can be converted into cash immediately or reasonably soon without a loss of value. The acid test ratio is generally considered to be more refined measure of the firm's liquidity. The acid test ratio is calculated as follows:

$$\text{Acid test ratio} = \frac{\text{Current assets inventory}}{\text{Current Liabilities}}$$

Interpretation: Generally a quick ratio of 1, 1(1.00) of greater is recommended. Again, what is considered an acceptable value depends on the industry in which the company operates

2. Gearing or Leverage (or Capital Structure) Ratios: The debt position of the business firm indicates the amount of other people's money that is being used in attempting to generate profits. Gearing ratios measure the funds supplied by owners as compared with the financing provided by the firm's creditors. The manners in which assets have been financed have a number of implications.

First, creditors look to the equity, or owners supplied funds to provides a margin of safety. If the owners have provided funds only a small proportion of total financing, the risks of enterprises are borne mainly by the creditors, second by raising funds through debt, the owners gain the benefits of maintaining control of the firm with a limited investment. Third, if the firm earns more on the borrowed funds than it pays in interest, the return to the owners is magnified. For example, if asset earn 10 percent and debt cost only 8 percent, there is a 2 percent differential accruing to the shareholders. The process of magnifying the shareholder's returns through the employment of debts is called "trading on equity". Gearing cuts both ways, however, if the return on assets falls to 3 percent, the differential between that figure and the cost of debt must be made up from

equity's share of total profits. In the first instance, where assets earn more than the cost of debt, gearing is favourable in the second, it is unfavourable.

Firms with low gearing ratios have less risk of loss when the economy is in a recession, but they also have lower expected returns the economy booms. Conversely firms with high gearing ratio run risk of large losses but also have a chance of gaining high profits. The prospects of high returns are desirable but investors are very averse to risk decisions about the use of gearing then must balance higher expected returns against increased risk.

In practice, gearing is approached in two ways, one approach examined balance sheet ratios and determines the extent to which borrowed funds have been used to finance the firm. The other approach measures the risk of debt by income statement ratio designed to determining the number of times fixed charges are covered by operating profits. These sets of ratios are complementary and most analyst examine both gearing ratios. Example of gearing ratios includes following:

(i) The debt ratio: this ratio measures the proportion of total assets provided by the firm's creditors. The higher this ratio the greater the amount of other people's money that is being used in an attempt to generate profits for the firm's owners. The ratio is calculated as follows:

i. Debt ratio $= \frac{\text{Total liabilities}}{\text{Total assets}}$

Creditors prefer moderate debt ratios, since the lower the ratio, the greater the cushion against creditors losses in the event of liquidation. In contrast to the creditor's preference of low debt ratio, the owners may seek high gearing either (a) to magnify earnings or (b) because raising new equity means giving up some degree of control. If the debt ratio is too high, there is danger of encouraging irresponsibility on the part of the owners. The stakes of the owners can become so small that speculative activity, if it is successful, will yield a substantial percentage return to the owners. If the venture is unsuccessful, however, only a moderate loss is incurred by the owners because their investment is small. Note that the higher this ratio is the more financial leverage a firm has.

(ii) The debt equity ratio: This ratio indicates the relationship between the long term funds provided by creditors and those provided by the firm's owners it is commonly used to measure the degree of financial leverage of the firm. It is calculated as follows:

Debt-equity ratio $= \frac{\text{Long term debt}}{\text{Stockholders equity}}$

Note that the stockholders equity is equal to the net worth. Firms with large amounts of fixed assets and stable cash flows typically have high debt equity ratios, while other, less capital intensive, firms normally have lower debt equity ratios. An industry average is a good figure to which to compare a debt equity ratio.

(iii) The debt to total Capitalization Ratio: this commonly used ratio has the same objective as the preceding ratio. It measures the percentage of the firm's long term funds supplied by its creditors. The firm's long term funds are referred to as its total capitalization. They include both long term debt and the stockholder's equity. The ratio of debt to total capitalization can be calculated as follows:

$$\text{Debt to total capitalization ratio} = \frac{\text{Long term debt}}{\text{Total capitalization}}$$

Since there is great similarity between the debt equity ratio and the ratio of debt to total capitalization, the analyst need use only one of these. In either case, the resulting value is meaningful only in the light of the nature of the firm's operations and industry averages.

6. Coverage Ratio: This group of ratios measures the firm's ability to meet certain fixed charges. Coverage ratios are most often concerned with the fixed charges resulting from the firm's debts. They are of great interest to the firms existing and prospective creditors, who are interested in its ability to service its existing debts and/or proposed debts. The lower the firm's coverage ratios, the more risky the firm is considered to be.

"Riskiness here refers to the firm's ability to meet the fixed obligations. If a firm is unable to meet these obligations, it will be in default and its creditors may seek immediate repayment. In most instances this would force a firm into bankruptcy. The ability of coverage ratios to measure this type of risk makes their use quite common. Some of the conventional coverage ratios include:

(i) **Time interest earned:** This ratio is often called the firm's total interest coverage ratio. It measures the firm's ability to pay its contractual interest payments. The times interest earned is calculated as follows:

$$\text{Times interest earned} = \frac{\text{Earning before interest \& taxes}}{\text{Annual interest expenses}}$$

The higher the value of this ratio, the better able the firm is to fulfill its interest obligations.

7. **Total debt Coverage:** This ratio is similar to the interest coverage ratio above, except that it measures not only the firm's ability to pay its interest charges but also its ability to repay the principle of loans or make sinking fund payments. Often as part of a bond or long term loan agreement, a firm is required to make periodic payments of principal either to the lender or into a fund which is being accumulated so that the debt can be retired at maturity. Whether one is concerned with an actual principle repayments or a payment into a sinking fund the procedure for calculating the ratio is the same.

It is important to note that principal repayments are made on an after tax basis and must be adjusted to a before tax amount in order to calculate the total debt coverage. Interest is a pre-tax expenditure and the interest and principle repayments must be measured on a common basis. The formula for the firm's total debt coverage is given below:

$$\text{Total debt coverage} = \frac{\text{Earning before interest and taxes}}{\text{Interest + principle payment } (1/1\text{-}t)}$$

Where:

t = the corporate tax rate applicable to the firm's income. The term 1(1-t) is include in order to adjust the income and the principle payment back to a pre-tax amount.

ACTIVITY RATIOS:

Activity ratios measure how effectively the firm employs the resources at its command. These ratios all involves comparisons between the level of sales and the investment in various assets accounts. The activity ratio presume that a proper balance should exist between sales and the various assets accounts stock, trade debtors, fixed assets, and others. Examples of activity ratios include:

(i) Stock (Inventory Turnover): This ratio indicates the efficiency of the firm's inventory management. It is calculated as follows:

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Inventory}}$$

The inventory turnover shows how rapidly the inventory is turning into receivables through sales. Generally a high inventory turnover suggests a good inventory management and a low inventory turnover implies excessive inventory levels than warranted by production and sales activities, "or a slow moving or obsolete inventory.

(ii) Average collection period: This is a measure of the debtor's turnover. It is computed in two steps.

(a) Annual sales are divided by 360 to get the average daily sales.

(b) Daily sales divided into trade debtors to finds the number of days sales tied up on debtors.

This is defined as the average collections period, because it represents the average length of time that the firm must wait after making a sales before receiving cash.

$$\text{Sales per day} = \frac{\text{Sales}}{360}$$

$$\text{Average collections period} = \frac{\text{Debtors}}{\text{Sales per day}}$$

Generally, a high fixed assets turnover ratio indicates efficient utilization of fixed assets in generating sales while a low ratio indicates inefficient management in utilization of fixed assets.

(iv) Total Assets Turnover: Total assets turnover; is concerned with the generation of sales, but other assets also contributed to the production and sales activities of the firm. The firm must manage its total assets efficiently and should generate maximum sales through that proper utilization. The total assets turnover is calculated as follows:

$$\text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

The total asset turnover ratio is a significant ratio since it shows the firm's ability of generating sales from all the financial resources committed to the firm. As this ratio increases, there is more revenue generated per naira of total investment in assets. So the higher this ratio the better.

PROFITABILITY RATIOS

There are a large number of profitability ratios, each relates the returns of the firm to either its sales, its assets, or its equity. As a group these measures allow the analyst to evaluate the firm's

earnings with respect to a given level of sales, certain level of assets, or the owners investment. Attention is paid to the firm's profitability since in order to stay in existence it must be profitable. Without profits a firm could not attract outside capital, moreover, existing creditors and owners would become concerned about the company's future and attempt to recover their funds. Creditor, owners and most importantly, management pay close attention to boosting the firm's profits due to the great importance placed on the earnings of the firm in the market place. Example of profitability ratios include:

i. The Gross Profit Margin: The gross profit margin indicates the percentage of each sales naira remaining after the firm has paid for its goods.

ii.

$$\text{Gross profit margin} = \frac{\text{Gross profits}}{\text{Sales}}$$

The higher the gross profits the better and the lower the relative cost of merchandise sold

iii. **Net Profit Margin:** This measures the percentage of each sales naira remaining after all expenses, including taxes, have been deducted.

iv.

$$\text{Net Profit Margin} = \frac{\text{Net Profit After Taxes}}{\text{Sales}}$$

The higher the firm's net profit margin the better

v. **The Return on Investment (ROI):** The return investment which is often called the firm's return on total assets, measures the overall effectiveness of management of generating profits with the available assets, it is calculated as follows:

$$\text{Return on Investment} = \frac{\text{Net Profit after taxes}}{\text{Total Asset}}$$

The higher the firm's return on investment, the better

vi. **Return on Networth:** The ratio of net profit after taxes to networth resources measures the rate of return on the shareholders investment. It is called calculated as follows:

vii.

$$\text{Return on Networth} = \frac{\text{Net Profit after taxes}}{\text{Networth}}$$

viii. Earning Per Share: The firm's earning per shares are generally of interest to the management and to current or prospective shareholders. The earning per share represents the number of naira earned on behalf of each outstanding share of common stock. They closely watched by the investing public and are considered an important indicator of corporate success. Earning per share are calculated as follows:

ix.

$$\text{Earning per share} = \frac{\text{Earning available for common stock}}{\text{Number of shares of common stock}}$$

CALCULATION AND EVALUATION OF THE RATIOS

For illustrative purpose, we shall use data taken from EZU Company, a producer of motor spare parts. Formed in 1975, the company grew steadily and in 1985 engages Alhaji IDU as managing Director.

Although Alahji Idu is experienced in motor spare part business, he does not have a detailed knowledge of his new company, so he has decided to a conduct a careful appraisal of the firm's position and on the basis of this position to draw up a plan for future operations. The analyses consist of an evaluation of the firm's liquidity, debt coverage and activity ratios.

Given the following financial statement and industry average ratios, the financial ratios for the EZU Company can be calculated and its financial position evaluated.

Industrial Averages

1.	Current ration	=	2.5 times
2.	Quick ratio	=	10 time
3.	Debt to total assets	=	33 percents
4.	Times interest earned	=	8.0 times
5.	Stock turnover	=	9.0 times
6.	Average collection period	=	20 days
7.	Fixed assets turnovers	=	5.0 times
8.	Total assets turnover	=	2 times
9.	Net profit margin	=	5 percent
10.	Return on total assets	=	10 percent
11.	Return on networth	=	15 percent

EZU COMPANY ILLUSTRATIVE BALANCE SHEET (N'000)

Assets 31st Dec. 1984 – Dec 31st 1985

Fixed asset	**N**	**N**
Plant & equipment	1,610	1,800
Less depreciation	400	500
Net fixed assets	1,210	1,300
Current asset: Stock	355	300
Debtors	250	200
Quoted Investments	175	150
Cash	52	50
Total current assets	832	700
Total assets	2,042	2,000
Liabilities and		
Stockholders Equity:		
Ordinary share capital	-	-
600,000 N1 ordinary share	600	600
Revenue reverse	380	400
Networth	980	1,000
Debenture Stock:		
80% First mortgage stock	520	500
10% Unsecured loan stock	200	200
	1,700	1,700
Current Liabilities		
Creditors and accruals	97	70
Short term loans	110	100
Corporation tax	135	130

Total current liabilities	342	300
Total liabilities	2,042	2,000

EZU Company Ltd. Illustrative Profit and Loss Account for the Year Ended 31st December 1985.

	N000	N000
Sales (net)		3,000
Cost of goods sold		2,555
Less operating expenses:		
Selling	22	
General and administrative	40	
Lease payment on official building	28	90
Grossing operating income		355
Depreciation		100
Net operating income		255
Add other income		15
Less other experiences:		
Interest on short term loan		10
Interest on the		
Debenture Mortgage		40
Interest on unsecured loan		20
Profit before tax		70
		200
Corporation tax		80
Net profit after tax, available to		
Ordinary shareholders		120
Earning per share		N0.20

CALCULATION OPERATIONS

1. Liquidity ratios

Current Ratio = Current Assets / Current Liabilities = N700,000 / N300,000 = 2.3 times

Industry Average = 2.5 times

EVALUATION: SATISFACTORY

The current ratio is slightly below the average for the industry, 2.5, but not low enough to cause concern. It appears that Ezu company is about in line with most other firms in this particular line of business. It should be noted that the industry average is not magic number that all firm's would strive to maintain. In fact, some very well managed firms will be above it, and other good firms will below it. However, if a firm's ratios are very far removed from average for its industry, the analyst must be concerned about why this variance occurs

Quick or Acid test ratio = $\frac{\text{Current Assets – Stocks}}{\text{Current liabilities}}$

= $\frac{\text{N400,000}}{\text{N300,000}}$

= 1.3 times

Industry average = 1.5 times

Evaluation: Good.

The company's 1.3 ratio compares favourable with other firms in the industry. If the firm can sell the quoted securities at book value and if can be collect the amounts outstanding on trade debtor, it can pay for its current liabilities without selling any stock.

2. Gearing ratios:

i. Debt to total Assets = $\frac{\text{Total debt}}{\text{Total Asset}}$

= $\frac{\text{N1,000,000}}{\text{N2,000,000}}$ = 50%

Industrial Average = 33%

Evaluation: Poor

The EZU Company debt ratio is 5o percent; this means that creditors have supplied half the firm's total financing. Since the average debt ratio for his industry is about 33 percent, this firm will find it difficult to borrow additional funds without first raising more money and the creditors would be reluctant to lend the firm more money and shareholders would be probably subjected to undue dangers if IDU (the Managing Director) sough to increase the debt ratio still more by borrowing.

3. <u>Coverage ratios:</u>

i. Times interest earned = $\frac{\text{Profit before interest \& taxes}}{\text{interest charges}}$

= $\frac{\text{N270,000}}{\text{N70,000}}$ = 3.9 times

Industry average = 8.0 times

Evaluation: Poor

Since the industry average is 8 times, this company is covering interest charges by a minimum marg8in of safety and deserves only a fair rating. This ratio reinforces the conclusion based on the debt ratio that the company is likely to face some difficulties if it attempts to borrow additional funds.

4. Activity Ratios:

i. Stock turnover = $\frac{\text{Sales}}{\text{Stock}}$

= $\frac{\text{N3,000.000}}{\text{N300,000}}$ = 10times

Industry average = 9times

Evaluation: Satisfactory

This suggests that the company does not hold excessive stock; excess stocks are of course, unproductive and represent an investment with a low or no rate of retune. This high turnover also reinforces the faith in the current ratios. If the turnover was low say 3.4 times, one would wonder whether the firm was holding damaged or obsolete materials not actually worth their stated value.

ii. Average collection period = $\frac{\text{Debtors}}{\text{Sales per day}}$

Sales per day = $\frac{\text{N3,000,000}}{360}$ = 8,333

Average collection period = $\frac{\text{N200,000}}{\text{N8,333}}$

= 24days

Industry average = 20days

Evaluation: Satisfactory

Compared to the industry average, the firm is not doing badly. However, it is evident that steps need to be taken to expedite the collection of debtors account. The fewer the days the better.

iii. Fixed assets turnover = $\frac{\text{Sales}}{\text{Net Fixed Assets}}$

= $\frac{\text{N3,000,000}}{\text{N1,300,000}}$ = 2.3 times

Industry average = 5.0 times

Evaluation: Poor

The firm's turnover of total assets is well below the industry average. The firm is simply not generating a sufficient volume of business for the size of its asset investment. Sales should be increase, or some assets should be disposed of or both step should be taken.

5. Profitability Ratios:

i. Net profit margin = $\frac{\text{Net Profit after taxes}}{\text{Sales}}$

= $\frac{\text{₦120,000}}{\text{₦3,000,000}}$

= 4%

Industry average = 5%

EVALUATION: POOR

The firm's profit margin is some what below the industry average if 5 percent, indicating that the firm's sales prices are relatively low or that its costs are relatively higher or both.

ii. Return on total assets = $\frac{\text{Net Profit after taxes}}{\text{Total Assets}}$

= $\frac{\text{₦120,000}}{\text{₦2,000,000}}$

= 6%

Industry average = 10%

EVALUATION: POOR
The firm's 6 percent return is well below the 10 percent average for the industry. This low rate results from the low profit margin on sales and from the low turnover of total assets.

iii. Return on Net Worth = $\frac{\text{Net profit after taxes}}{\text{Net Worth}}$

= $\frac{₦120,000}{₦1,000,000}$

= 12%

Industry average = 15%

Evaluation: Poor
The firm's 12 percent return is below the 15 percent industry average but not as the return on total assets.

Summary of the Ratios Calculated for the EZU Company Ltd
The above ratio calculated gives a reasonable good idea of the company's main strength and weakness. First, the company's liquidity position is reasonably good; its current and quick ratio appear to be satisfactory by comparison with the industry average. Second, the gearing ratios suggest that the company is rather heavily indebted with a debt ratio substantially higher than the industry averages, it is doubtfully that the firm could raise more additional debt financing except on relatively unfavourable terms. Even if they could borrow more, to do so would be subjecting the company to danger of default and liquidation in the event of a business downswing.
Turning to the activity ratios, the stock turnover and average collection period both indicate that the company's current assets are pretty well in balance, but the low fixed assets turnover means on effect, that the company probably could have operated with a smaller investment in fixed assets. Had the expensive fixed asset investment not been made, the company could have avoided some its debt financing and would now have lower interest payments. This in turn, would have led to improve gearing and coverage ratios.
The profit margin on sales is low, indicating that cost are too high or that prices are too low or both. Returns on both total investment and networth are also below the industry averages. These relatively poor results are directly attributable to the low profit margin on sales which lowers the numerators of the ratios, and to the excessive investments which raise the denominators.

Limitation of Ratio Analysis
Although ratios are exceptionally useful they do have limitation and must be with caution. The following are some of the limitations of the ratio analysis:
Ratios are constructed from accounting data, and accounting data are subject to different interpretation and even to manipulation. For example, two firms may use different depreciation methods or stock evaluation methods, depending on the procedures followed; reported profits can be raised or lowered.
2. It is difficulty to decide on the proper basis for comparison: Ratios of a company have meaning only when they are compared with some standards. It is difficult to find out a proper basis of comparison. Usually it is recommended that ratios should be compared with industry averages. But the industry averages are not easily available.

3. The situations of the companies are never the same. Similarly, the factor influencing the performance of a company in one year may change in another year. Thus, the comparison of the ratios of two companies becomes difficult and meaningless when they are operating in different situations.
4. There is nothing sacred about the industry average figures, because most firm's strive to achieve better than the industry average.
5. When firms use different operating and accounting procedures, it might be difficult to compare their ratios.
6. Some firms use window dressing techniques to make their financial statements look better to analyst.

CHAPTER IV

BUDGETING
ESSENTIALS OF BUDGETING

A successful and sound budgeting system is based upon certain prerequisites. These prerequisites or essentials represent management attitude, organization structure and management approaches necessary for the effective and efficient application of budgeting system. The following are some of the important, essentials or fundamentals of a successful budgeting;

1. Top management support
2. Clear and realistic goals
3. Assignment of authority and responsibility
4. Creation of responsibilities centres
5. Adaption of the accounting system (responsibility accounting)
6. Full participation
7. Effective communication
8. Budget education
9. Flexibility

TOP MANAGEMENT SUPPORT

A budget system will be an utter failure if it is not initiated and supported by top management. Top management must realize that budgeting is not merely an accounting device, but it is an important management tool.

Top Management Must:

i. Understand the nature and characteristics of budgeting.
ii. Be convinced that this particular approach to managing is preferable
iii. Be willing to devote the effort required to make it operative
iv. Support the programme in all its ramifications.

CLEAR AND REALISTIC GOALS

Budgeting is a means to achieve goals and objectives. All planning presupposes that objective and goals have been clearly and unambiguously established. Budgeting will not succeed if the goals to be achieved are not clear, budget implementation will not be systematic. In the absence of goals clarity, employees will lack a proper direction; the efforts of management will be wasted, thus. The financial manager or the budget director, therefore must ensure that objective and goals have been properly laid down. As far as possible, objective and goals should be written in formal terms. But too much formality should be avoided as it can make budgeting system inflexible.

The enterprise objectives and budgeting should be reasonable and realistic, they should capable of attainment, budget goals should not be set at too high or too low level. Goals set at a very high level are impossible to attain and as a result, have a depressing effects on the employee morale.

ASSIGNMENT OF AUTHORITY AND RESPONSIBILITY

A sound organizational structure is essential for the success of the budgetary system. Authorities and responsibilities of each manager should be clearly identified and established. A sound

organizational structure and a clear cut assignment of authorities and responsibilities provide an effective means to achieve the enterprise objective and budget goals in a coordinated and efficient manner. The budgetary system should be established in terms of the assignment of authorities and responsibilities; the performance of each manager should be evaluated in terms of the assigned authorities and responsibilities. If there is no synchronization between the budget system, and the organization structure of the enterprises, the planning and control system would not be effective. In the absence of clear-cut assignment or they will be held accountable for those activities for which they have no responsibilities.

CREATION OF REPSONSIBILITY CENTRES

A small firm can possible be managed by an individual or a small group of individuals, but the activities of a large firm cannot be supervised by an individual or a few individuals. For effective control of all activities, a large firm is divided into meaningful segments, departments or division, each sub-unit has certain activities to perform and its manager is assigned specific authority and responsibility to carry out those activities. The sub-units of an enterprise for the purpose of control are called responsibility centre or decision centres. A responsibility centre is sub-units of an enterprises under the control of a manager who has the authority and responsibility centre can be a big unit… such as a production department or a small unit, such as a cash section of an accounting department or a machine in the production department. The important criteria for creating a responsibility centre are that units of the organization should be separable and identified for operating purposes, and that the performance measurement should be possible. For planning and control purposes, responsibility centre are usually classified into three classes: cost centres, profit centres and investment centres.

Cost centre: A cost centre is a responsibility centre where the manager is responsible for costs (expense) incurred in the sub-unit. He is not responsible for profit or investment in the centre. Thus, costs are the primary planning and control data in a cost centre. The performance of the managers is evaluated by comparing the actual expense incurred with the budgeted expenses for the cost centre. For control purposes, the management attention is focused upon the variables between actual and budgeted expenses.

In a cost centre the consequences of decisions are measured by costs alone, the accomplishments of the cost centres are not measured in financial terms. Thus, the effectiveness of the cost centres cannot be properly evaluated. A cost centre spending the least is considered as the best. This kind of analysis of course, ignores the contributions made by the cost centre to the firm's overall profitability.

Profit Centre: A profit centre, also known as a contribution margin centre, is a responsibility centre where the manager is responsible for both costs and revenue and thus, for profits (or contribution margin). A profit centre provides more effective assessment of performance as both cost and revenues are measured in financial terms. A profits centre is more relevant for profit planning and control as it allows the measurement of both output and inputs units of the centre to ensure effective control. Through the profit centre control system, the (controllable and non-controllable) activities should be identified. The manager of a profit centre should be held responsible only for those costs and revenues which are controllable by him through his decisions.

The direct cost are usually non-controllable, therefore, they may not be allocated to a profit centre. If the allocation of indirect cost is avoided one may think in terms of contribution margin centres rather than profit centres. Contribution margin is the difference between controllable (variable) costs and revenues of the centres.

Investment Centre: An investment centre is a responsibility centre where the manager is responsible for costs and revenues as well as for the investment in assets used by the centre. In an investment centre, performance is assessed not used as the performance evaluation criteria in an investment centre. In a sense, investment centre are treated as separate firms where manager is responsible for the overall activities affecting costs revenues and investment.

The creation of responsibility centres: Cost centre profit centres and investment centres are essential for successfully implementing plans budges attaining objectives and accomplishing control. A budgetary system should be tailored to the organizational sub-units the responsibility centres.

Adaptation of the Accounting System

The accounting system catering only to the need of external use is not adequate for the purpose of profit planning and control and internal management Budgeting is based on the data generated by the accounting system. Control of performance results with the planned performance. Therefore, the accounting system should be suitably adapted to facilitate the planning and control process it should be adapted to areas of responsibility. In fact a sound budgetary system needs the creation of a responsibility accounting system. A responsibility accounting system is primarily oriented towards the organizational responsibilities and is a means to achieve effective control. The account are classified and prepared by responsibility centre. An accounting system tailored to the responsibility structure of the enterprises; generate data that are relevant to the planning and control system.

A cost accounting system has two primary aims; (i) to measure the cost of production and (ii) to furnish data for planning and control. Historical cost accounting has paid more attention to the measurement of cost of production than the planning and control functions. In responsibility accounting, the emphasis is on planning and control; accounts are classified on responsibilities basis not on a product cost basis. The cost accumulated for planning control purposes can easily be cast basis. The cost accumulated for planning control purposes can easily be recast for product costing purposes. But it is difficult to use cost data accumulated for product cost purposes for planning and control. In summary it may be stated that, for effective and successful budgeting the accounting system must be structured around the planning and control needs of management.

FULL PARTICIPATION

Full participation of manager and their subordinates at all level should be sought in developing the budgeting system. The participation should be meaningful and real. If employee have effectively participated in developing the budget goals and targets, they will make special effort to see that the budgeting process succeeds. A meaningful participation creates a positive motivation "participation tends to increase commitment, commitment tend to heighten motivation; motivation which is job oriented tends to make manager work harder and more productively; and harder and more productive work by managers tends to enhance the company prosperity therefore, participation is good. To reemphasize, it is the real and meaningful participation that is good. A non serious effort on the part of top management to see participation of managers and their subordinate will not motivate them, rather times, it produces negative motivation and makes employees less productive.

EFFECTIVE COMMUNICATION

Communication is the process of transmitting thought or information from one person to another. The basic purpose of communication is to bring mutual understanding between two or more persons. It is a device to bring people together in an enterprises. A sound budgeting system requires effective communication of budget goals and means of implementing budgets through the organization so that a unified effort may be directed to accomplish these objectives and goals.

BUDGET EDUCATION

We have noted earlier that participation of all should be sought in preparing budgets, and that the budgets are prepared by line executives though the final approval is accorded by top management. Participation can be meaningful only when people at all levels of management are convinced of the usefulness of budgets, understand the nature and characteristics of budgets and know the role which they have to play in profit planning and budgets and control. In fact, for the success of budgeting, everyone in the enterprises should have confidence in the budgeting system and should be involved and committed to it. The line executives who actually prepare the budgets, should not only be confident on their ability to plan the future with reasonable precision, but also should understand the technicalities of budgeting. They should know how to readjust the budgets when the circumstances change. They should also be able to "sell!" the idea of budgeting to their subordinates in order to seek their meaningful participation and involvement. This requires continuous budget education. The employees of an enterprise must be educated about the nature, characteristics, value and methods of budgeting. They should be taught how to interpret the budget results and how the performance is evaluated through budgets. Seminars, conference, lectures, discussion executive development.

Programmes etc can be organized. Written materials can also distributed. The line executive, who must be well conversant with budget methods, may be given on the job training, explaining to them how budgets are actually prepared. Whatever may be the methodology, the basic point to be emphasized is that there should be a proper system of educating employees about various factors of budgeting to have a better improvement, commitment and participation.

FLEXIBILITY

The budgeting system should be flexible enough to take advantage of all opportunities that raise from time to time and are not covered by the budget. Inflexibility impairs the initiatives and freedom of managers and subordinates in making decisions. A rigidly administered budgeting programme dominates the business and imposes "strait jackets" in implementing the budgets (plans). On the other hand, if the budgeting programme is administered in a flexible and sophisticated way, managers at all levels get greater freedom in applying the budget (plans). In fact, budgeting is a device to bring all levels of management together into decision-making process of the enterprises. Once the budgets have been developed with full participation of all and have been approved, top management can delegate more authority and responsibility to lower levels of management and can exercise better control over them through budgets. In other words, budgeting allows more freedom to management at lower levels; within the broad framework of budgets they are free to make decisions in the absence of a sophisticated budgeting system. A flexible and comprehensive budgeting permits management to readjust plans when a new situation arises

The principle of flexibility is particularly significant in cost control: the expenses budgeted for an anticipated level of activity. Expenses budgets should be used rigidly, therefore, variable or flexible expense, budgets are employed to make a meaningful comparison of the actual and budgeted expenses when the anticipated circumstances change.

TYPE OF BUDGETS

All enterprises make plans-some in a systematic and formal way, while others in informal manner. However, they differ in their budgeting practices. Generally, the large and medium firms have a comprehensive system of budgeting; they prepare budgets for all this important operations; but the small firms and some large and medium firms do not have a comprehensive system of budgeting they prepare budgets for a few of their operations. We have emphasized previously that a comprehensive budgeting involves the preparation of master budget with a complete package of the component budgets.

The three important components of the master budgets are:

i. Operating budgets
ii. Financial budgets and
iii. Capital! Budgets.

OPERATING BUDGETS

Operating budgets relate to the planning of the activities or operation of the enterprises, such as production, sales and purchases. Operating budgets is composed of two parts, a programme, or activity, budget and a responsibility budget. These represent two different ways of looking at the operations of the enterprises; thus arriving at the same result. The programme during the next year. One logical way to prepare this king of budget is to plan for each product the expected revenues and their associated costs. The programme budget exhibits the expected future in an impersonal manner and is helpful in ensuring balance among various operations or functions of an enterprises.

The responsibility budget specifies plans in terms of individual responsibilities. The basic purpose of this kind of budgets is to achieve control by comparing the actual performance of a responsible individual with the expected performance. Of course, an individual will be responsible only for the controllable activities. An individual should be
involved to prepare those parts of the operating budget which related to his area of responsibility.
These two ways of depicting the operating budget are significant because the programme budget is primarily a planning process while the responsibility budget is a control device. The programme budget need not to be tailored to the organizational structure of the enterprise, but the responsibility budget must be. Therefore, the plan (programme budget) must be converted into the control (responsibility budget) before the actual implementation and communicated to the persons involved in the execution of the plan so that they may precisely known what is expected of them.
These are two ways in which the operating budget may be prepared;

i. Periodic budgeting and
ii. Continuous budgeting involves the preparation of budget for the forthcoming year. Without providing for a comprehensive revision as the budget period passes. The budgeting period is generally divided into months; that is, the annual budget consists of the monthly estimates. Continuous budgeting provides for a system for revising the budget for the changing conditions

continuously. The method involves the prepration of a tentative annual budget with provisions that the month or quarters just ended is dropped and a month or quarter in the future is added. Continuous (or rolling) budgeting forces management constantly to think in concrete terms about its short range planning.

In case of stable firm, which can forecast with reasonable precision, periodic budgeting can be used. Continuous budgeting would however, be desirable in case of those firms which operate under the uncertainties of consumer demands and are exposed t a great degree of cyclical fluctuations.

FINANCIAL BUDGETS

Financial budgets are concerned with the financial implications of the operating budgets the expected cash in flow and cash outflow, financial position and the operating result, the important components of financial budgets are, cash budgets; proforma balance sheet and income statement and statement of changes in financial position.

Cash budgets are the most important component of the financial budgets. A good management would keep cash balance at optimum level; too little cash endangers the liquidity of a company and too much cash tends to impair profitability. The major objective of the cash budget, therefore, is to plan for cash in such a way that the company always maintains sufficient cash balance to meet its needs and uses the idle cash in the most profitable manner.

In addition to a cash budget it is useful to prepare a projected, or proforma, balance sheet and income statement. Cash budgets reveal. Expected cash position of an enterprise while proforma. Financial statements give information as to the future assets, liabilities and income statement items. The proforma statements are prepared to identify the anticipated result; of the budgeted operations. The analysis of the present and past financial, statements indicates direction of change in the financial position and performance of the enterprise. The future can be planned to follow the past direction or to change. The preparation of the cash budget and proforma statements compels management to look ahead and balance its policies and activities. The cause of the changes in the financial position of an enterprises is better revealed by the statement very clearly shows the sources and uses of the firms financial resources. The projected statement of changes in financial position can be prepared from the proforma balance sheet and income statement to show the effect of the budgeted operations on the financial resource of the firm and, accordingly, the firm can plan its policies to pay dividends, refund debts, acquire fixed assets, borrow loans or issue share capital.

CAPITAL BUDGETS

Capital budgets involve the planning to acquire worthwhile projects, together with the timings of the estimated cost and cash flows of each project. Such project requires large sum of funds and have long-term implication for the firm. Capital budget are difficult to prepare because estimate of the cash flows over a long-periods have to be made which involves a great degree of uncertainty.

The capital budget are generally prepare separately from the operating budgets. In many companies, there is a committee separate from the budget committee to appropriate funds for capital investment projects. In the capital budgeting, the profitability of each project has to be carefully evaluated. Various techniques are used to determine the profitability of a project free from personal base and capable of indicating whether the project should be accepted or not.

BUDGETARY CONTROL

We have already state that on the major purposes of budgeting is to provide a bench mark for controlling performance of managers and their subordinates. Control is sought to be achieved comparing actual performance and taking an action to correct the budget variance. In fact, he budget control process involves a number steps:

1. Realistic budgets or plan are prepared to provide direction to carry out business operations.
2. Actual performance for each area of responsibility is measured. Generally, the accounting system is used to measure actual performance in financial items.
3. Actual performance is compared with the budgeted performance to identify significance deviation from budget (or variance).
4. As a feedback mechanism, repots are prepared to inform management about deviation from budgets (plan).
5. Corrective action is initiated to ensure that future performance is in accordance with budget (plan).

Action may involve motivating people to implement policies, modify certain policies, retaining employees or change the manufacturing methods. The budget (plan) will have to be revised if the deviation is done to incorrectly set budget (plan).

The principal of management by exception should be apply while enforcing control through budgets No action or intervention is require so long the actual performance approximately conform with budget (plan). Management attention should be focused only on exceptional or significant deviation. To determine significant deviation control limits that represent the range of normal deviation from budget (plan) should be developed.

FLEXIBLE BUDGET

Crucial aspect of budgetary control is the comparison of actual performance based on actual level of activity with budgeted performance based on expected (budgeted) level of activity. However, the deviations will not be meaningful if actual level of activity differs from expected or planned level activity. To measure the deviations (variances) correctly, actual performance should be compared with budgeted performance for actual level of activity.

This necessitates the need for flexibility within the budgeting system, it should be able to allow for changing conditions, planned, or expected level of activity is difficult.

A fixed or static budget can be used to measure variance if there is much difference between actual level of activity and planned level of activity. Budgets prepared at a single level of activity, with no basis for modifying them to changed circumstance are called fixed or static budgets. When there is significant difference between actual level of activity and planned of activity for purpose of performance evaluation. In such a situation, a performance report prepared after the fact to show what revenue and costs should have been at the actual level of activity. For example, if a firm expected to produce 10,000 units during a given period but could produce only 9,000units the budget or plan with revenues and cost based upon 10,000 units would not be a meaningful standard for measurements. A performance report showing the revenue and cost that should have been incurred at 9,000 units would be more appropriate for appraising performance.

The performance budget is prepared from the flexible budget. A flexible budget is a series of fixed budgets that provide for an estimate of revenues and cost at different levels of operating activity. A

system of flexible budgeting provides for adjusting the budgeted revenues and costs for the actual level of activity experienced in the budget period. A hypothetical flexible budget is illustrated in the table below.
Flexible budget illustrated in the table below:

Flexible Budget Illustrated

Level of Activity (Unit)

	2002	4,000	6,000	8,000	10,000	12,000
Revenue at ₦8	₦16,000	₦32,000	₦48,000	₦64,000	₦80,000	₦96,000
Variable cost at	₦36,000	12,000	18,000	24,000	30,000	36,000
Fixed cost	20,000	20,000	20,000	20,000	20,000	20,000
Total cost	26,000	32,000	38,000	44,000	50,000	56,000
Net profit	(10,000)	0.000	10,000	20,000	30,000	40,000

While preparing a flexible budget, costs should be divided as variable and fixed. Variable cost vary (in total) in direct proportion to the level of activity. On the other hand, total fixed costs remains constant with the level of activity practice, majority of the costs remain constant in nature (i.e. variable as well as fixed) various techniques can be used to divided mixed costs into their fixed and variable parts.

ADVANTAGES OF BUDGETING

To reiterate budgeting is a management tool, it is a way of managing. Many benefits are derived from budgeting, although it is a means not an end in itself. Budgeting is a feed forward process; it makes an evaluation of the variable likely to affect future operations of the enterprise. It predicts future with reasonable precision and removes uncertainty to a greater extent. The following are some of the more significant advantages of budgeting:

1. Budgeting compels management to plan for the future. The budgeting process forces managements to look ahead and become more effective and efficient in administering the business operations. It instills into managers the habit of evaluating carefully their problems and related variable before making any decision.
2. Budgeting helps to cordite, integrate and balance the efforts of various departments in the light of overall objectives of the enterprise. This result in goal congruency and harmony among departments.
3. Budgeting facilitates control by providing definite expectations in the planning phase that can be use as frame of reference for judging the subsequent performance. Undoubtedly, budgeted performance is a more relevant standard for comparison than past performance, since past performance is based on historical factors which are: constantly changing.
4. Budgeting improves the quality of communication. The enterprises objectives, budget goals, plans, authority and responsibility and procedures to implement plans are clearly written and communicated through budgets to all individuals on the enterprises. This result in better understanding and harmonious relations among managers and subordinates.
5. Budgeting help to optimize the use of the firm's resources capital human; it aids in directing the total efforts of the firm into the most profitable channels.

6. Budgeting increases the moral and thus, the productivity of the employees by seeking their meaningful participation in the formulation of plans and policies, bringing a harmony between individual goals and the enterprise objectives and by providing incentive to perform more effectively? Budgeting develops an atmosphere of profit mindedness and cost consciousness.
1. Budgeting helps to focus management attention on significant matters through budgetary reports, thus, it facilitates management by exception and thereby saves management time and energy considerably.
2. Budgeting measures efficiency, permits management self-evaluation and indicates the progress in attaining enterprises objective.

PROBLEMS AND DANGERS OF BUDGETING

1. Budgeting is not an exact science; its succeeds hinges upon the precision of estimates. Estimates are based on facts and managerial judgment can suffer from subjectism and personal biases. The adequacy of budgeting, thus, depends upon the adequacy of managerial judgment.
2. The installation of a perfect system of budgeting is not possible in a short period. Business conditions change rapidly; therefore budgeting program should be continuously adapted. Budgeting has to be a continuous exercise; it is a dynamic process. Management should not lose patience, they should go on trying various techniques and procedures in developing and using the budgeting system. Ultimately, they will achieve the success and reap the benefit of budgeting.
3. A skillfully prepared budgetary programme will not itself improve the management of an enterprise unless it is properly implemented. For the success of the budgetary programme, it is essential that it is understood by all, and that the managers and subordinate put concerned effort for accomplishing the budget goals. All persons in the enterprises must have full involvement in the preparation and execution of budgets, otherwise budgeting will not be effective.
4. Budgeting is a management tool a way of managing, not the management. The presence of a budgetary system should not make management complacent. To get the best results of managing, management should use budgeting with intelligence and foresight, along with other managerial techniques. Budgeting assists management; it cannot replace management.
5. Budgeting will be ineffective and expensive if it is unnecessarily detailed and complicated. A budget should be precise in format and simple to understand; it should be flexible, not rigid in application.
6. The purpose of budgeting will be defeated if the carelessly set budget goals conflict with enterprises objectives. This confuses the means with the end results. Budget goals are the definite targets to achieve the overall enterprise objectives. They must be in harmony with enterprise aims.

7. Budgeting will lower morale and productivity if unrealistic targets are set and if it is used as a pressure tactic. To some extent budgeting may be used as a device, but its extent must be carefully determined.

CHAPTER V

WORKING CAPITAL MANAGEMENT

INTRODUCTION

Working capital management is concerned with the manager of the firm's current account which includes current liabilities. The management of working capital is one of the most important aspects of firm's overall financial management. If the firm cannot maintain a satisfactory level of working capital it is likely to become insolvent and may even be force forced into bankruptcy. The firm's current assets should be large enough to cover its liabilities in order to ensure a reasonable margin of safety.

The goals working capital management is to manage each of the firm's current assets and current liabilities in such way that an acceptable levels or net working capital is maintained. The major current assets of concern in this text are cash, marketable securities, account receivable and inventory. Each of these assets must be managed efficiently in order to maintain the firm's liquidities while not keeping too high a level of anyone of them. The basic current liabilities of concern are accounts payable and accruals. Each of these short term sources of financing must be cautiously managed to ensure that they are obtained and used in the best way possible.

The most common definition of networking capital is different between a firm's current assets and current liabilities. As long as the firm's current assets exceed its current liabilities, it has net working capital. Most firms must operate with some amount of net working capital, how much depend largely on the industry. Firm's with very predictable cash flows can operate with negative net working capital, however most firms must maintain positive levels of net working capital.

The rationale for the use of working capital to measure a firm's liquidity is the belief that the greater the margin by which a firms current assets cover its short-term obligation (current liabilities) the more able it will be to play its bills as they come due. However, a problem arises because each current asset and current liabilities has a different degree of liquidity associated with it. Although the firm's current assets may not be converted into ash at precisely the point in time when it is needed the greater the amount of current assets present the more likely it is that some current assets will be converted into cash in order to pay a debt that is due.

It is the non-synchronous nature of a firm's cash flow that makes net working capital necessary. The firm's cash out-flows resulting from payment of current liabilities are relatively predictable. It generally, learns when bills are due. When an obligation is incurred. For instance when merchandise is purchased on credit, the credit terms extended to the firm require payment at a known point in time. The same predictability is associated with notes payable and accruals which have stated payments dates. What is difficult to predict are the firm's cash inflows. Predicting when current assets other than cash and marketable securities will be converted into cash is quite difficult. The more predictable these cash inflows are the less net working capital a firm requires

It is the inability of most firm's to match cash receipt and cash disbursement that makes sources of cash receipts (current assets) that will more than cover current liabilities necessary. For example if the MIFO Company has the current position given in the table below, the following situation may exist

The Current Position of the Mifo Company

Current Liabilities		**Current Assets**	
Account Payable	N600	Cash	N500

Notes payable	800	Marketable securities	200
Accruals	200	Accounts Receivable	800
Total	**N1,600**	Inventory	1,200
		Total	**N2,700**

All N600 of the firm's account payable plus N200 of its notes payable and N100 in accruals, are due at the end of the current period. That is N900 in outlays must be made is certain, how the firm will cover these outlays is not certain. The firm can be sure that N700 will be available since it has N500 in cash. The remaining N200 must come from the collection of an account receivable and/or the sale of inventory for cash. The firm cannot be sure when either a cash sale or the collection an account receivable will occur. More uncertainty is associated with cash sale. Although customers who have purchases goods on credits are expected to pay for them by the date specified in the credit arrangement, quite often they will not pay until a later date thus cash flows associated with the purchases will not occur at the point in time they are expected.

Of course, some solution to this dilemma must exist in order to have a higher probability of having sufficient cash to pay its bills, a firm should attempt to make sales , since in many cases they will result in the immediate receipt of cash and in other cases they will result accounts receivable which will eventually be converted into cash. A level of inventory adequate to satisfy the probable demand for the firm's products should be maintained. As long as the firm is generating sales and collecting receivables as they come due sufficient cash should be forthcoming to satisfy its cash payment obligations. The Mifo Company can increase the profitability of its being able to satisfy its obligations by maintaining sufficient levels of accounts receivable and inventory to allow the conversions of some of these are on hand, the greater the profitability that some of these items will be turn into cash. As a rule contain level of networking capital is often recommended in order to ensure that a firm will be able to pay bills, the Mifo Company has N1,100 of networking capital (N2,700/N1,600) which will most likely be sufficient to cover all its bills. Its current ratio of 1.69 (N2,700/N1,600) should provide sufficient liquidity as long as its account receivable and inventories are relatively liquid.

MANAGEMENT OF CASH AND MARKETABLE SECURITIES

1. Cash is the most important current assets for the operation of the business. Cash is the basic input needed to keep business running on continuous basis; it is also the ultimate output expected to be realized by sell the services or product manufactured by the firm. The firm should keep sufficient cash, neither more or less. Cash shortage will disrupt the firm's manufacturing operation while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.
2. Cash management is concern with the managing of; (i) cash flows (ii) cash flows within the firm and (iii) cash balance held by the firm at a point of time. Cash management assumes more importance than other current assets because cash is the most significant and at least pay the firm's obligations. However, cash is reproductive and therefore the aim of cash management should is to maintain adequate cash position to keep the firm sufficiently liquid and to use excess cash in some profitable way.
3. The management of cash is also important because it is difficult to predict cash flows accurately and that there is no perfect coincidence between the inflows and outflows of cash.

In order to resolve the uncertainly about the cash flow prediction and lack of synchronization between cash receipt and payments, the firms should develop some strategies for cash

management. The firm should be evolving strategies regarding the following four facets of cash management;

1. **Cash Planning:** Cash flow and outflows should be planned to project cash surplus or deficit for each period of the planning period. Cash budget should be prepared for this purpose.
2. **Managing the Cash flows:** the flow of cash inflow and outflows should be properly managed. The inflow of cash should be accelerated while as far as possible, outflows of cash should be decelerated.
3. **Optimum Cash Level:** The firm should decide about appropriate level of cash balances. The cost of excess cash and danger of cash deficiency should be matched to determined the optimum level of cash balances
4. **Investable Cash:** the idles cash or precautionary cash balances should be properly invested to earn profits. The firm should decide about the division of such cash balance between bank deposits and marketable securities. Before discussing these aspects of cash management in detail we explain the reason for holding cash.

MOTIVATION FOR HOLDING CASH

1. The transaction motive
2. The precautionary motive
3. The speculative motive

The transaction motive requires a firm to hold cash to conduct business in the ordinary course. The firm needs cash primarily to make payments, for purchases, wages, operating expenses, taxes, dividends, etc the need to hold cash would not arise if there were perfect synchronization between cash receipts and cash payments or enough cash is received when the payment has to be made. But cash receipts exceed cash payment while at other times cash payments are more than cash receipts. For those periods when cash payment exceeds cash receipt, the firm should maintain some cash balance to be able to make the required payments. For transaction purposes a firm may invest its cash in marketable securities. Usually the firm purchases the securities whose maturity correspond with some anticipated payment, such as dividends, taxes etc. in future. However, the transactions motive mainly refers to holding cash to meet anticipated purchases whose timing is not perfectly matched with cash receipts. The precautionary motive is the need to hold cash to meet any contingence in the future. It provides a cushion to buffer to withstand any unexpected emergency. The precautionary amount of cash depends upon the predictability of cash flows. If cash can be predicted with accuracy, less cash will be maintained against an emergency.

The amount of precautionary cash is also cash is also influenced by the firm's ability to borrow at short notice, when the need arises, stronger the ability of the firm to borrow at short notice, less the need for precautionary balance. The precautionary balance may be kept in cash and marketable securities. The amount of cash set aside for precautionary reasons is not expected to earn anything, therefore, the firm should attempt to earn some profit on it. Such funds should be invested in high-liquid and low risk marketable securities. Precautionary balance should, thus, be held more in marketable securities and relatively cash.

The speculative motive relates to the holding of cash for investing in profit making opportunities and when they arise. The opportunity to make profit may arise when the security prices changes.

The firm will hold cash, when it is expected that interest rates will rise and securities prices change. The firm will hold cash, when it is expected that interest rate will raise and security price

will fall. Securities can be purchased when the interest rate is expected to fall; the firm will benefit by the subsequent fall in interest rates and increase in security prices

The firm may also speculate on materials' prices. If it is expected that materials prices will fall, the firm can postpone materials purchasing and make purchase in future when it actually falls. Some firms may hold cash for speculative purposes. By and large, business firms do not engage in specifications. Thus, the primary motive to hold cash and marketable securities are the transactions motive and the precautionary motive.

The firm must decide the amount of transaction and precautionary balances to be held. This depend upon the following factors

1. The expected cash inflows and outflows based on the cash budgets and forecasts, encompassing long and short range cash needs of the firm.
2. The degree of deviation between the expected and actual net cash flows
3. The maturity structure of the firm's liabilities
4. The firm's ability to borrow at short notice in the events of any emergency
5. The philosophy of management regarding liquidity and risk of insolvency
6. The efficient planning and cash control

   All those factors analyzed together, will determine the appropriate level of the transactions and precautionary balance.

CASH PLANNING

Cash planning is a technique to plan for and control the use of cash. It protects the financial condition of the firm by developing a projected cash statement from a forecast of expected cash inflow and outflows for a given period. The forecasts may be based on the present operations or the anticipated future operations. Cash plans are very crucial in developing the overall operating plans of the firm.

Cash planning may be daily, weekly or monthly basis. The period and frequency of cash planning generally depend upon the size of the firm and philosophy of management.

Cash forecasting and Budgeting:

Cash budge is a significant device to plan for and control the cash receipts and payments. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows cash balances over the projected period. This information helps the financial manager to determine the future cash needs on the firm, plan for the financial of these needs and exercise control over the cash and liquidity of the firm.

CASH FORECASTING

Cash forecasting are needed to prepare cash budgets. Cash forecasting may be done on short-term or long –term basis. Generally, forecasts covering periods of one year or less are considered short-term; those extending beyond one year are considered long-term.

Short-term Forecasts: It is comparatively easy to make short-term forecasts. The important uses of carefully developed short-term cash forecast are:

1. It helps to determine operating cash requirements
2. It helps to anticipate short-term financing
3. It helps to manage money market investment
4. Planning reductions of short and long term debt
5. Scheduling payments in connection with capital expenditures programmes.

6. Planning forward purchase of inventories
7. Checking accuracy of long range cash forecasts
8. Taking advantage of cash discount, offered by suppliers
9. Guiding credit policies

Long-term Cash Forecasting: Are prepared to give an idea of the company's financial requirements in distant future. They are not as detailed as the short-term forecasts are. Once a company develop long-term forecast, it can be used top evaluate the impact of new product developments or plant acquisitions on the firm's financial condition some several years in the future.

The major uses of the long-term cash forecasts are:

1. It indicates a company's future financial needs, especially for its working capital requirements.
2. It helps to evaluate proposed capital projects. It pinpoints the cash required to finance these projects as well as the cash to be generated by the company to support them.
3. It helps to improve corporation planning. Long-term cash forecast compel each division to plan for future and formulate projects carefully.

MANAGING THE CASH FLOWS

The twin objectives in managing the cash flows should be accelerate cash collections as much as possible and to accelerate or delay cash disbursements as much as possible

ACCELERATION CASH COLLECTION

A firm conserves cash and reduces the requirements for cash balances, if it can speed up its cash collections. Cash collection can be accelerated by reducing the gap between the time a customer pays his bills and the time the cheque is collected and funds becomes available for the firm's use. Within this time gap. The delay is caused by mailing time i.e the time taken by cheque in transit and the processing time, i.e the time taken by the firm in process for internal accounting purposes. The amount of cheque sent by customers but not yet collected is called deposit float. The greater will be the firm's deposit float, the longer the time taken in converting the cheque into usable funds. An efficient financial manager will attempt to reduce the firms deposit float by speeding up the mailing, processing and collection times. The following are the techniques which can be used to do so.

DECENTRALIZED COLLECTIONS

a large firm operating over wide geographical areas can speed up its collections by following a decentralization collection procedure. A decentralization collection procedure, called centralization banking is a system of operating through a number of collection centres, instead of a single collection centre centralized at the firm's head office. The basic purpose of decentralized collections is to minimize the lag between the mailing time from customers to the firm and the time when the firm can make the use of funds. Wider decentralized collections, the firm will have a large number of bank accounts operated in the areas where the firm has its branches. The selection of the collection centre will depend upon the volume of billing. The collection centre will be required to collect cheques from customers and deposit in their predetermined minimum to a central or concentration bank account generally at the firm's head office each day. A concentration bank is one where the firm has a major account usually disbursement account. Fund can be

transferred to a central or concentration bank by wire transfer or telex. Decentralized collection procedure is, thus a useful way to reduce float.

Decentralized collection system saves mailing and processing time and reduces the financial requirements. For example, suppose Mifo company has credit sale of N10,000,000 per year. Its collection will aver N40,000 per day if it has 250 working days in a year. If Mifo company could reduce it mailing and processing time from two days to one day and deposit cheques into bank a day earlier its book debts balance would be reduced by N40,000. If Mifo company's borrowing rate was 8 percent, it has saved an opportunity cost of N3,200 per year. Thus decentralized collection system results in potential savings which should be compared with the cost of maintaining the system. The system should be adopted only when the saving are greater than the cost. Lock-box system: another technique to speeding up the mailing processing and collection time still further is a lock box system. In case of the concentration banking cheques are received by a collection centre and after processing are deposited in the banks receipt of cheque and their deposited in the bank. In a lock box system the firm establishes a number of collection centres considering customer location and volume of remittance at each centre the firm hires a post office box and instructs its customers to mail their remittance to the box. The bank picks up the mail several times a day and deposits the cheques in the firm's accounts. For internal accounting purposes of the firm, the bank prepares the detailed records of the cheques picked up.

The two main advantage of the lock-box system are: Firstly, the bank handles the remittance prior to deposit at a lower cost. Secondly, the cheques are deposited immediately upon receipt of remittance and their collection process starts sooner than if the firm would have processed them for internal accounting purposes prior to their deposit. The firm can still process the cheques on the basis of the records supplied by the bank without delaying the collection. Thus lock box system eliminates the period between the time cheques are received by the firm and the time they are deposited in the bank for collection.

MANAGEMENT OF A CCOUNTS RECEIVABLE

The level of trade debtors is determined by (a) the volume of credit sales and (b) the average collection period is partially dependent upon economic conditions during recession period of extremely tight money, customers may be forced to delay payment, but it is also dependent upon a set of controllable factors (a) credit standard or the maximum riskiness of acceptable credit account (b) credit period or the length of time for which credit is granted (c) discounts given for early payment and (d) the firms collection policy

CREDIT STANDARDS

If a firm makes credits sales to only the strongest of customers it will not incur much in the way of expenses it will pay for a credit department. On the other hand it will probably be losing sales, and the profit foregone on these lost sales could be far larger than the cost it has avoided. Determining the optimal credit standard involves equating the marginal cost of credit to the marginal profits on the increased sales.

Marginal costs include (a) default, or bad losses (b) higher investigations or collection costs and (c) if less credit worthy customers delay payment longer than stronger customers, higher cost of capital tied up in debtors. Since credit costs and credit quality are correlated, it is important to be able to judge the quality of an account. The quality of an account can be defined in terms of the profitability of default.

Character: Refers to the profitability that customer will try to honour his obligations. Experienced credit men frequently insist that the factor is the most important issue in a credit evaluation.
Capacity: is a subjective judgment of the ability of the customer. This is measured by his past records supplemented by physical observation of the customer's factory or shop and business methods.
Capital: Is measure by the general financial position of the firm as indicated by a financial ratio analysis, with special emphasis on the tangible networth of the enterprises.
Collateral: Is represented by assets that the customer may offer as a pledge for security of the credit extended to him. Finally
Conditions: refers to the impact of general economic trend on the firm or to special developments in certain areas of the economy that may affect that customer's ability to meet his obligations.

TERMS OF CREDIT
The terms of credit specify the period for which credit is extended and the discount if any given for early payment. One common billing procedure or terms of credit allow 2% discount if payment is made within 10 days and the entire amount is due 30 days from the invoice date if the discount is not taken. This is normally written as "2/10net 30". If the terms are stated as "net within 60 days" this indicates that no discount is offered and that the invoice is due and payable 60 days after the invoice date.
Lengthening the credit period stimulate sales. But there is a cost to tying up funds in debtors. For example, if a firm changes its terms from net payment within 30 days to net within 60 days, the average debtors for the year might rise from N100,000 to N300,000, with the increase caused partly by the large volume of sales. If the cost of capital needed to finance the investment in receivable is 8 percent, then the marginal cost of lengthening the credit period is N16,000 (N2,000,000 x 8 percent). If the incremental profit sales price minus all direct production, selling and credit cost associated with the additional sales exceeds N16,000, then the change in credit policy is profitable. Determining the optimal credit period involves locating that period where marginal profits on increased sales are exactly offset by the cost of carrying the higher amount of trade debtors.

CASH DISCOUNTS
The effect of granting cash discount may be analyzed similarly to the credit period. For example, if a firm changes its terms from "net within 30 days" otherwise 2/10 net 30, it will attract customers who wants to take discounts, thereby increasing Gross Sales. Also the average customer will pay more promptly to take advantage of the discount. Offsetting these benefits is the cost of the discount taken. The optimal discount is established at the point where costs and benefits are exactly offsetting.

COLLECTION POLICY
Collection policy refers to the procedures the firm follows to obtain payment of overdue accounts. For example, a letter may be sent to such customers when the account is 10days overdue; a more severe letter, followed by a telephone call, may be used if payment is not received within 30 days and the account may be turned over to a collection agency after 90 days. The collection process can be expensive in terms of both out of pocket expenditure and lost of goodwill, but at least some firmness is needed to prevent an undue lengthening in the collection period to minimize outright

losses. Again a balance must be struck between the cost and benefits of different collection policies.

INVENTORY MANAGEMENT

Inventory represents a major current asset investment by most manufacturing firms. Inventory is necessary for the productions-sale" process of the firm to operate with minimum of disturbances. A stock process is required to ensure that required items are available when needed. Finished goods inventories must be available to provide a buffer stock that will enable the firm to satisfy sales demands as they arise. The financial manager must be concerned, about all types of inventories, raw materials, work in progress and finished goods. He must monitor inventory levels to make sure that excess inventory build up do not occur.

The financial manager views inventory as an investment that consumers Naira. He attempts to make sure that not too many Naira are invested in it and likes low levels, especially of finished goods inventories, in order to assure quick deliveries and a minimum of stock-outs.

The production manager is concern with raw materials and work in progress inventories. He likes to make sure that sufficient inventory is available to permit continuous production. His actions directed on the level of the finished goods inventory. The purchasing manager is concerned with raw materials and generally prefers higher levels of inventory. The conflicting viewpoints of all these parties must be resolved in order to have efficient inventory management. The financial manager must act as a watch dog over inventory levels.

INVENTORY MODELS

Inventories are obviously necessary but it is equally obvious that a firm will suffer if it has too much or too little inventory. The question then is how we can determine the optimal inventory level. One of the most commonly cited sophisticated tools for determining the optimal order for an item of inventory is the economic order Quantity (EOQ) model. It takes into account various operating and financial costs and determines the order quantity that minimizes the firm's overall inventory costs.

THE EOQ MODEL

Our discussion of the economic order quantity model here will over

i. The basic costs included (ii) A graphical approach
iii. A mathematical approach and (iv) The weakness of the model.

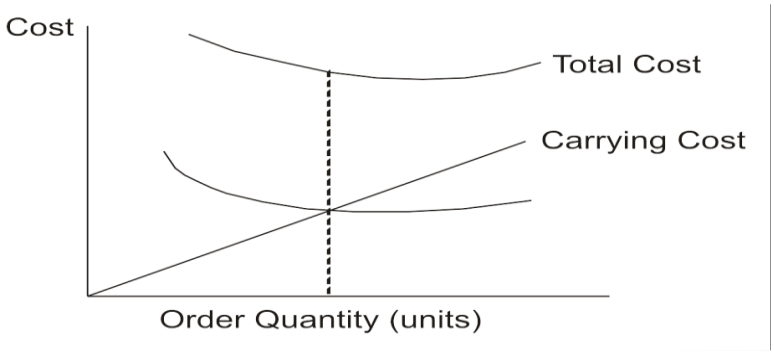
Basic Costs: Excluding the actual costs of the merchandise, the costs associated with inventory can be divided into three broad groups.

Order Costs: Order costs include the fixed clerical costs of placing and receiving an order the cost of writing a purchases order of processing the paper work and receiving and order and checking against the invoice. Order costs are formally stated as Naira per order.

Carrying Cost: Carrying costs are the variable per unit of hold an item in inventory for specified period of time. These costs are typically stated as Naira costs, insurance cost, the cost of deterioration and obsolescence and most importantly the opportunity cost of trying up funds in inventories. The opportunity cost component it is the cost of the returns that have been foregone in order to have the current investment and inventory.

Total Costs: The total costs are important, in the EOQ mode, since its objective is to determine the order quality that minimizes them.

A Graphical Approach: The stated objective of the EOQ approach is to find the order quantity that minimize total inventory cost (i.e the EOQ). The economic order quantity can be found graphically by plotting order quantities on the X axis and cost on Y axis. EOQ occurs at the point where the order cost line and the carrying cost line intersect as shown in the diagram below as shown in the diagram the order cost function varies inversely with order quantity. In other words, as the order quantity increases, the cost for the period decreases. This can be explained by the fact that since the annual usage is fixed, if larger amounts are ordered fewer orders and therefore lowers order costs are incurred and therefore lower costs are incurred. Carrying costs are directly related to order quantities. The larger the order quantity the larger the average inventory and therefore the higher the total cost.



The total cost of function exhibits a U-shape, which means that a minimum value for the functions exists. The total cost line represents the sum of the order costs and carrying costs for each order quantity.

A Mathematical Approach: A formula can be developed for determining a firm's EOQ for a given inventory item.

Let: U = Annual usage in Units
F = Fixed costs of placing and receiving an order
C = Carrying cost expressed as percentage of stock
P = Purchase price per unit of stock
EOQ = The economic quantity to be ordered each time an order is placed

The firm Total Cost Equation: Can be developed. The first step in developing the total cost equation is to develop an expression for the order cost function and the carrying cost function.

The Order Cost: Can be expressed as the product of the numbers and the cost per order. Since the number of orders equals the usage during the period divided by order quantity (i.e U/EOQ) the order cost can be expressed as follows:

Order Cost = F x U/EOQ ……(1)

The Carrying Cost: Has been defined as the firm's average inventory (i.e EO/2) multiplied by the cost of carrying a unit per period. The average inventory has been defined as the order quantity divided by 2, since the inventory is assumed to be depleted at a constant rate. Thus, the carrying cost can be expressed as follows:

Carrying Cost = C x EOQ/2 ……(2)

Analyzing Equation (1) and (2) shows that as the order quantity increases the order cost will decrease while the carrying cost increase proportionately. The total cost equation is obtained by combining the order cost and carrying cost expressions in equation (1) and (2) as follows:

Total cost = F x U/EOQ + C x EOQ/2 …….. (3)

Since the EOQ is defined as the order quantity that minimize the total cost function. Equation (3) can be solved for the EOQ

$$EOQ = \frac{2FU}{CP}$$

Illustration:

If we are given the following information:

U = Usage = 100units
C = Carrying Cost = 20% of stock value
P = Purchase Price = N1per unit
F = Fixed Cost of order = N10

Substituting these values into the formula we obtain

$$\frac{2.00}{0.2}$$

$$EOQ = \sqrt{\frac{2FU}{CP}}$$

$$= \sqrt{\frac{2 \times 10 \times 100}{0.2 \times 1}}$$

$$= \sqrt{10{,}000 \text{units}}$$

$$= 100\text{units}$$

Note: If the desired safety stock is 10units, then the average stock will be

$$\text{Average Stock} = \frac{EOQ + \text{Safety Stock}}{2}$$

Illustration 2:

If we are given the information below

U = N1,600 units = Usage in units per annum
F = N50 = Ordering costing
C = N1 = Carrying cost per unit.

We can calculate EOQ by substituting into the formula.

$$EQO = \sqrt{\frac{2FU}{CP}}$$

$$= \sqrt{\frac{2 \times 50 \times 1{,}600}{1}}$$

$$= \sqrt{160{,}000}$$

$$= 400\text{unit}$$

The basic stock control model recognizes that certain costs (carrying cost) rise an average stock levels increases but that certain other costs (ordering costs and stock-out costs) fall as average stock level rise. These two sets of costs make up the total cost of ordering and carrying stocks and EOQ model is designed to locate an optimal order size will minimize total costs of stock control.

Note: If the cist per order changes the elasticity of EOQ with respect to cost per order.

$$= \frac{\text{\% change in EOQ\%}}{\text{\% change in cost per order}}$$

WEAKNESS OF EOQ MODEL

The EOQ model has certain weaknesses that are directly attributable to the assumptions on which it is based. The assumption of a constant usage rate and the instantaneous replenishment of stock are quite questionable. Most firms maintain safety stock as a buffer against an unusual increase in demand or slow delivery. The assumption of a known annual demand for items is also quite questionable. Actually, a demand forecast is used to make the order quantity decision. If the forecast differs greatly from the actual outcome, 'wrong' EOQ may be used.

Although the EOQ model has some weakness, it certainly provides the decision maker with better grounds for a decision than subjective observation only. Although the financial manager normally is not directly associated with the use of the EOQ model, he must be aware of its utility. He must also provides certain financial inputs specially with respect to inventory carrying costs, in order to permit the use of the EOQ model.

THE REORDER POINT

Once the firm has calculated its economic order quantity it must determine when to place an order. In the preceding EOQ model it was assumed that orders were received instantaneously when the inventory level reached zero. Actually, a reorder point is required that consider the lead time needed to place and receive orders.

Assuming, once again a constant rate for inventory, the reorder point can be determined by the following equation.

Recorder Point: Lead time in days x daily usage. For example, if a firm knew that lit required ten days to receive an order once the order was placed and uses 5 units of inventory daily the reorder point would be 50n units (i.e 10 x 5). As soon as the firm's inventory level reach 50 units, an order would be placed for an amount equal to the economic order quantity. This order would be received exactly when the inventory level reach zero. This reorder point formula is based on the assumptions of a fixed lead time and fixed daily usage. However, more sophisticated reorder formulas, based on less restrictive assumption are available.

CHAPTER VI

WORKING CAPITAL MANAGEMENT AND EFFICIENT MARKET ONSIDERATIONS

INTRODUCTION

In considering the valuation of the firm under varying assumptions as to the perfection of capital markets, while the discussion involved investments in assets and financing in general, implied focus was on fixed assets and long-term financing. By tradition perhaps more than anything else, a split has evolved between consideration of current assets (short-term financing) and fixed assets (long – term financing) current assets, by accounting definition are assets normally converted into cash within one year. Working capital management is usually described as involving the administration of these assets namely, cash and marketing securities, receivables, and inventories and the administration of current liabilities. Administration of fixed assets (assets normally not converted into cash within the year), on the other hand, is usually considered to fall within realm of capital budgeting, whereas administration of long-term financing involves capital structure considerations.

In our view, this split is unfortunate, for it has trend to cloud the valuation of the firm, as a whole. There is no question but that from the standpoint of the day-to-day operations of the typical financial manager, the management of current assets and liabilities occupies the bulk of his attention. Unfortunately, this repetitive concentration has tends to result in a myopic approach to such management. Most of the work dealing with working-capital management has been confined to the left-hand side of the balance sheet. Where it has been directed to optimizing the level of cash and marketable securities of receivables and inventories. For the most part, the optimization process is in isolation of the optimization of other current assets and of the overall valuation of the firm.

The separation in treatment of current and fixed assets is often justified on the basis of differences in their nature. Fixed assets are said to be lumpy in the sense that they involve the commitment of funds to a specific asset over an extended period of time, during which the asset is thought to have limited marketability. In contrast, current assets are often viewed as a continuum of possible investment levels as opposed to investment in specific form or type of liquid inventory, while this distinction has some validity we feel it has been exaggerated and has resulted in an isolation of current asset decisions from fixed asset decision and from the overall valuation of the firm. On the liability side! Much less distinction exists in theory as well as in practice between current and long term liabilities. Here the important variable is maturity, and the breakdown between current and long term liabilities is arbitrary.

Conceptually, it does not make sense to divorce the various components of working capital management from the more fundamental decisions of investment and financing. In practice, however we must recognize that many firms; do separate working capital management from other aspects of financial management. In recent years there have evolved some highly sophisticated associated with a particular level of current assets are balanced against the risk adjusted cost of maintaining it. While these models provide efficient decision rules, virtually all of them optimize in a partial equilibrium sense. It is clear that what is needed is an understanding of current assets and liability decisions in light of the overall valuation of the firm.

In this chapter, we endeavor to present this conceptual understanding. In this regard, we categorize the various components of working capital management according to the avenues by which they

impact valuation. These categories are liquidity, receivables and inventories and current liabilities. As the chapter unfolds we will see that a decision reached in these areas determines the amount of working capital the firm maintains. However, the latter emerges as a by product, it does not represent an active decision in itself. The discussion in this chapter is purposely general so as to provide an overview for judging working capital decisions in relation to the valuation of the firm. Hopefully, this overview will give a better perspective for decisions in involving specific current assets and liabilities which will be examined later.

LIQUIDITY AND ITS ROLE

Liquidity may be defined as the ability to realize value in money the most liquid of assets. It has two dimensions (1) the time necessary to convert an asset into money and (2) the degree of certainly associated with the conversion ratio, or price realized for the asset. While most asserts have a degree of liquidity, we will focus on the most liquid assets of the firm-cash and marketable securities. Liquidity management then involves determining the total amount of these two types of assets the firm will hold. Implied is that we hold constant the credit policies and procedures of the firm, its inventory management and control and the administration of its fixed assets; for decisions here affect the overall liquidity of the firm. Thus, a narrow definition of liquidity is taken in order to simplify our decision of certain principles.

LIQUIDITY WHEN PERFECT CAPITAL MARKET EXISTS

Recall that under the assumptions of perfect capital markets, a firm could not alter its value by varying its capital structure, its dividend policy, and the diversification of the assets it holds. If we invoke these assumptions again, the degree of liquidity of the firm also would be a matter of indifference to equity holders. Presumably, investors would manage their portfolios of common stocks and other assets, as well as their liabilities, in such a way as to satisfy their utility for liquidity. As a result, the liquidity of individual firms would not be a factor enhancing shareholders wealth. In essence the argument is that the firm is unable to do something for investors that they cannot do for themselves. The same argument applies to the irrelevance of capital structure decisions (where investors are able to undertake homemade leverage by borrowing on their own) of dividends decisions (where investors are able to manufacture homemade dividends selling a portion of their holdings) and of diversification of asset decisions (where investors are able to diversify on their own).

Implied in the assumptions of perfect capital markets is that if the firm should become technically insolvent and unable to pay its bills, creditors are able to step in instantaneously and realize value by liquidating assets by running the economy themselves or by effecting a costless reorganization. If the assets are sold, assumed is that they are employed productively without delay or inefficiency in other areas of the economy. When we allow for the costs of desirable characteristics affecting value. Note that there are two dimensions to bankruptcy costs.

The first is the shortfall arising from the liquidation of assets at distress prices below their economic value. The second is the out-of-pocket fees paid to lawyers, trustees in bankruptcy, referees, receivers, liquidators, and so forth embodied in the “shortfall” phenomenon is the fact that considerable delays are involved in bankruptcy preceding during which time the firm and its value can continue to deteriorate. With respect to out of pocket costs, certain studies show that administrative costs approximate 20 percent of the 19 states. Although the documentation of

bankruptcy costs is sketchy, there appear to be a number of inefficiency in bankruptcy costs is sketchy, there appear to be a number of inefficiency in bankruptcy proceedings which make administrative costs high.

LIQUIDITY MANAGEMENT WITH BANKRUPTCY COSTS

In effect, bankruptcy costs represent a drain in the system to suppliers of capital. This drain obviously works to the disadvantage of equity holders, who have a residual claim on assets in liquidation. Moreover, creditors may pass on all or part of the exact costs of bankruptcy in the form of higher interest rates on loans than would be the case in the absence of such costs. This obviously also works to the disadvantages of equity holders, investors are unable to diversify away the costs of bankruptcy. However the firm can reduce the probability of bankruptcy by maintaining liquidity.

This reduction may benefit stockholders, particularly if by avoiding bankruptcy and its associated cost in one period through maintaining liquidity, future states are likely to prevail where bankruptcy does not occur. Under these circumstances, bankruptcy cost could be avoided although, and considerable benefits would accrue to stockholders as residual owners of the firm. Thus, the firm may be able to do something for stockholders that they cannot do for themselves. If bankruptcy is merely postponed bankruptcy costs will eventually be incurred. Whether or not stockholders benefit in this case depends on the circumstances, but it is clear that if they do benefit it will be to a much lesser degree than in the previous case. As liquidity is increased, the probability of technical insolvency can be reduced. The benefits associated with this reduction depend on the magnitude of bankruptcy costs avoided. To illustrate with a simple example, suppose we have a two period model assume the initial probabilities of insolvency and the bankruptcy costs shown in the upper panel of table 4.1.

Table 4.1
Illustration of bankruptcy costs

Present State	**Probability**	**Present value of Bankruptcy**	**State**	**Probability**	**Present value of bankruptcy Cost**
Zero liquidity					
Insolvency	0.2	N1,000	insolvency	0.2	N500
		N500			
Solvency	0.6	0	insolvency	0.9	0
N20,000 liquidity					
Insolvency	0.1	N750			
Solvency	0.0	0	Insolvency	0.1	N1,000
Insolvency	0.2	N500	Solvency	0.7	0
N40,000 liquidity					
Insolvency	0.1	N750	Solvency	0.7	0
Insolvency	0.2	N700	Solvency	0.9	0
Solvency	0.8	0			

Let us suppose further that if insolvency occurs, creditors will initiate bankruptcy proceedings and liquidate the company. As a result, bankruptcy costs will be initiated. We assume then that the

entire table able gives the probability of insolvency in periods 1 and 2 together with the present values of bankruptcy costs. Under the assumption that no liquidity is maintained. Note that in period 1 there are two states in which insolvency occurs, each with a difference present value of bankruptcy costs. The expected value of present value of bankruptcy costs for the situation of zero liquidity is (.2) N1,000 + (.2) (500) + (N500) = 330 (4.1)

Suppose now that the firm were considering maintaining initial liquidity levels of N20,000 and N40,000 and that these levels changed the probabilities of insolvency and bankruptcy costs to those figure in the middle and lower panels of table 4.1 respectively, the expected value of present value bankruptcy costs when the firm maintains an initial liquidity level of N20,000 is (.1) (N750) + (.9) (700) (N1,000) + (9) (500) = N255 + (9) (N700) = N201 4-3 thus by increasing liquidity from zero to N20,000 the expected value bankruptcy cost can be lowered from N330 to N255. By increasing it from N20,000 to N40,000 the expected value is lowered from N255 to N201 in this situation, then there are positive benefits associated with maintaining liquidity, it lowers the probability of insolvency in period as well as the joint probability of bankruptcy occurring the two periods.

BENEFITS RELATIVE TO COST

Against the benefits associated with maintaining liquidity one must balance the cost. In the final analysis, liquidity must be raised through financing in a general sense, its cost might be though to be the differential in interest rate, and there would be no cost to maintaining whatever level of liquidity was desired to reduce the probability of technical insolvency. If imperfections exist in the capital markets which result in the borrowing rate exceeding liquidity. Under these conditions, a trade off exists between the benefits associated with liquidity and the cost of maintaining it. The optimal level of liquidity then could be determined by marginal analysis.

While quantification of this trade off is complex, our purpose has been to explore the problem in concept. The important thing to remember is that justification for maintaining cash and marketable securities depends on the presence of certain market imperfections which render financial markets less than perfect. In particular, one needs to concentrate on bankruptcy if it had ready access to external financing. Instead of using a liquidity buffer it would simply raise funds externally to offset a downside deviation in operating cash flows. In this way the firm would be able to meet its creditor and contractual obligations, but it would not need to maintain liquidity in order to do so. However, if there is flotation costs associated with external financing, this alternative becomes less attractive. In addition to out-of-pocket flotation costs there may be imperfections that cause delays in the ability of the firm to bring about external financing. Both of these factors would straighten the case for liquidity to reduce the probability and hence the cost of bankruptcy.

Thus the important thing in establishing a case for a firm maintaining any liquidity is the presence of market imperfection which makes liquidity a thing of value. If the various imperfections discussed can be approximated it is possible to determine in theory at least the appropriate level of liquid assets the firm should maintain. While we will propose more practical means for looking at the problem in subsequent chapters, it is important to keep in mind the valuation of liquid assets in a market context. In the absence of specific imperfections in financial markets, liquidity management is not a thing to value to shareholders.

RECEIVABLE AND INVENTORIES

Receivables and inventories can and should be evaluated from much the same perspective as fixed assets whose evaluation we shall take up later. Many capital budgeting projects embody

receivables and inventories as well as a fixed asset component. Examples include a new distribution system where a new warehouse is involved and a new product decision where manufacturing facilities must be added. As discussed earlier, the thing that tends to differentiate receivable and inventories from fixed assets is that much of the analysis of the former is framed in terms of overall level, whereas analysis of the latter is framed in terms of specific assets. From the standpoint of the overall valuation of the firm, however this distinction is unimportant. Capital building projects can be evaluated as a package of assets.

ANALYSIS IN MARKET CONTEXT

It is overall market valuation approach is employed to analyze risks investment, the package can be judge using the capital assets pricing model. In applying this model, this model, the appropriate discount rate for a risky investment proposal.

$R = i + \frac{R_m - i}{2m} (r_{km}\text{-km})$ $(4.4R_k) = i + (Rm\text{-}1) (r_{km}\text{-km})$

Where:

R_k	=	required rate of return for investment project k
i	=	risk free rate
R_m	=	expected rate of return on the market portfolio
k	=	standard deviation of the probability distribution of possible returns for project k
m	=	standard deviation of the probability distribution of possible returns for project k
r_{km}	=	correlation between rates of returns for proposal k and the market portfolio
k	=	standard deviation of the probability distribution of possible returns for project k

Required rate of return for an investment in receivable and/or inventories the term (r_{km} – km) is the covariant of returns for project k with those of the market portfolio, whereas (R_m i)/2m represents the market equilibrium relationship between excess returns and risk. As we know from before, Eq. (4.4) can be expressed as:

$Rk = i + (Rm – i)B_k$

Where:

B_k is a measure of the responsiveness of excess market returns on the project to excess return on the market portfolio. This term is known as the beta of the asset, and it portrays the degree of systematic risk. According to the capital assets pricing model the relevant risk of an investment project is its systematic risk. This is the risk that remains in the firm's stock after efficient diversification.

Our purpose here is to suggest that the same principles that hold for the valuation of fixed assets hold for the valuation of receivables and inventories according to the assumption embodied into the capital assets pricing model an investment project should have the same required rate of return regardless of the particular firm that undertakes it.

This is illustrated in figure 4.1 where the market determined relationship between expected return and systematic risk is shown by the diagonal line. For a level of systematic risk equal to say, y, the

required return is found by tracing up to the diagonal line and then over to the vertical axis to pint x. Thus the project requires an expected return of x or greater in order for it to be acceptable, just because a particular project has the same required rate of return for all firms does not mean that it is equally valuable to all of them. Due to expertise and operating efficiencies some firms will be able to generate greater profitability from the project than will other firms. Projects that are comprised entirely of receivable or of inventories can be evaluated using this approach. An example of the former is a decision of whether or not to lower credit standards, where the latter might involve a decision to stock a greater number of parts.

The advantage of the approach is that, it allows consideration of projects with greatly different risks. A separate required rate of return is determined for each project, and this return is based on the systematic risk of the project in a market context. The lower the risk, the lower the required rate of return.

This is particularly important when it comes to project comprised heavily of receivables and/or inventories. As these assets frequently are less risky than fixed assets, they would require a lower return. The virtue of this approach is in specifying a required rate of return. Low enough to take account of the project's inherent safety.

CURRENT LIABILITIES

For purposes of present analysis, we assume that the firm has an established policy with respect to payment for purchase labour, taxes, and other expenses. As a result, payable and accruals represent passive decision variables: they change in keeping with changes in the level of production or services offered and, in the case of taxes, payable with a change in income before taxes. In a sense, this component of current liabilities represents built in financing; it tends to rise as the firm expands and fall as the firm contracts. In contrast, the other component of current liabilities, which we call the active component, should be determined as part of more basic decisions involving determination of the maturity composition and other conditions of the firm's debt. By other conditions, we means such thing as whether or not the debt is insured, the type of security, the type of call feature, and whether or not it is convertible. Determination of the total amount of debt the firm should maintain will be taken up when we examine the capital structure of the firm. Our concern now is with the type of debt that should be used.

THE VALUE IMPLICATION OF DEBT MATURITY AND OTHER CONDITIONS

If perfect financial markets are assumed, not only is the debt versus equity question irrelevant but so are questions about the majority and other conditions of the debt. Under this assumption, all of the firm's financial liabilities would have same cost on a certainty equivalent basis. The statement follows from our previous discussion of arbitrage to efficient financial markets. As the argument is a familiar one by now we need not repeat it. If imperfections exist in financial markets, however, different financial liabilities may have different certainty equivalent cost, cost of information, and legal constrains on investing by certain institutions may make the maturity and other conditions of a firm's debt relevant consideration. When it comes to their impact on value. For example, if flotation costs are roughly the same for all maturities, there will be an inventive for the firm to issue longer-term debt, all other things the same. The reason is that this financing policy would reduce the number of times the firm had to issue debt and incur flotation costs. On the other hand

the presence of bankruptcy cost might cause certain secured debt instruments to be used in the absence of such costs.

While we would not expect the impact of market imperfections with respect to maturity and other conditions of debt versus equity, nonetheless some effect may exist which causes different financial liabilities to have some what different certainty equivalent costs. With different certainty equivalent cost, the firm would not be indifferent as to the type of debt instrument it issued.

Unfortunately, the differential impact of various financial liabilities has not received nearly the attention in the literature as has the debt versus equity question. There has been a reasonable amount of research on the call feature and some on the maturity structure of corporate debt. While most of this work supposes the notion of efficient markets, the empirical tests involved are not precise enough to pick out the subtle effect to market imperfections. There has been virtually no work on the effect of different types of secured positions on the value of debt. With bankruptcy cost, we would expect in theory at least that variation in the type of secured positions would have an effect on the debt's value. The same principle would apply to the various protective covenant included in the loan agreement or bond indenture. These covenants give the lender greater flexibility to effect changes should the borrower financial condition deteriorate.

Clearly, much more work needs to be done on the subject. In this book, we allow for possibility that difference in maturity and other conditions may result in differences, although slight in the certainty equivalent costs to a company of the various debt instruments available. We assume, therefore, that these factors may be relevant considerations when it comes to structuring the financial liabilities of the firm. To assume otherwise would negate the need to examine the features of various financial instruments.

The important thing to realize in closing this section is that the amount of current liabilities the firm maintains is the result of more fundamental decisions concerning the maturity composition of its debt. Any debt with a maturity of one year or less, by accounting definition, is a current liability. However, the active component of the current liabilities should not be determined in isolation, but rather as part of an overall determination of the best combination of financial liabilities for the firm. The amount of debt that falls into current liabilities is incidental.

IMPLICATIONS FOR WORKING CAPITAL

In the proceeding sections of this chapter, we have presented a conceptual overview for reaching decisions concerning cash marketable securities, receivable, inventories and current liabilities. This overview was in keeping with an objective of maximizing the overall value of the firm. Once decisions are reached concerning these areas the level of working capital by definition, is also determined. However, the latter is not determined in any active decision sense, but rather falls out as a residual from the decisions made above.

Thus, working capital current asset less current liabilities has no economic meaning in the sense of implying some type of normative behavior. According to this line of reasoning, it is largely an accounting artifact. Working capital management then, is a misnomer; the working capital of the firm is not managed. Instead, the term is used describe management decision affecting specific

types of current assets and current liabilities, in turn, those decision should tooted in the overall evaluation of the firm.

SUMMARY

In this chapter, we took up the evaluation of the firm as it pertains in particular to the current asset and liabilities of the firm. We argue that in theory it does not make sense to separate decision involving current asset and liabilities from the overall investment and financing decision of the firm. Falls of the distinction between current and fixed and long-term liabilities is largely an accounting one. In practice, however, there some characteristic associated with current assets that differentiate them somewhat from fixed asset, and these were explored.

The various component of the working capital were categorized along functional line and analyzed in keeping with the evaluation of market context. These components were liquidity, receivable and inventories and current liabilities. We saw that the theoretical justification for maintaining liquidity rests on the presence of bankruptcy costs. Given these costs, liquidity management can be a thing of value. Receivables and inventories can be evaluated in much the same manner as fixed asset by using the capital asset pricing model. The advantage of this approach is that it allows determination of required rate of return in keeping with the inherent safety, or lack thereof, of receivable and inventories.

The last area of concern was the current liabilities of the firm. The amount of current liabilities the firm maintains falls out as a byproduct of fundamental decisions involving capital structure, and the maturity and other condition of the debt.

CASH BUDGETING

The cash budget, or cash forecast allows the firm to plan its short-term cash needs. Typically, attention is given both to planning for surplus cash and to planning for cash shortages. A firm expecting cash surplus can plan short-term investment where as a firm expecting shortages in cash must plan how to obtain short-term financing. The cash budget gives the financial manager a clear view of timing of both cash inflow and cash outflows expected over a given period. This type of information is invaluable in his overall planning.

Typically, a cash budget is designed to cover a one year period although any time horizon is acceptable. The period covered is normally divided into intervals. The number and type of intervals depends greatly on the nature of the business.

THE SALES FORECAST

The key input to any cash budget is the sales forecast. This is typically given to the manager by the marketing department. On the basis of this forecast the financial manager by the monthly cash flows that will result from projected sales receipt and production or inventories related outlays, he also determines how much financing if any, will be required to supply the forecast level of production and sales and whether it can be obtained.

The sales forecast may be based on analysis of external or internal forecast. An external forecast is based on the relationship that can be observed between a firm’s sales and certain economic indicators such as the gross national product and disposable personal income. Internally generated

forecasts are based on a build-up of sales forecast through the firm's sales channel. Typically, the sales men in the field give information with regard to the number of product they expect to sell in the coming year.

Firms generally use both external and internal forecast data in making up the final sales forecast. The internal forecast data provide insight into sales expectations while the external data provide a way of adjusting these expectations by taking into account general economic factors. Many firms selling necessities are not greatly affected by economic factor, whereas the sales of other firms are highly responsive to changes in economic activity. The number of the product often affects the mix of forecasting method used.

The general format of the cash budget

	Jan	Feb	Nov	Dec
Cash receipt	-	-	-	-
Less cash disbursement	-	-	-	-
Net: Cash flow				
Add: beginning cash	-	-	-	-
Ending cash:				
Add Required Financing	-	-	-	-
Ending cash with financing	-	-	-	-

Cash Receipt

Cash receipt includes the total of all items from which cash flow result in any given month. The most common components of cash receipt are cash sales, collection of credit and other cash receipts.

Examples:

The MIFO Goods Company is developing cash budget for October, November and December. Sales in August and September were ₦100,000 and ₦200,000, while ₦400,000. ₦300,000 and ₦200,000 have been sales forecast for October, November and December respectively. Historically, 20 percent of the firm sales have been for cash, 50 percent have generated accounts receivable collected after one month, and the remaining 30 percent have generated account receivable collected after two months. Bad debt expenses have been negligible. In December the firm will receive a 30,000 dividend from stock in a subsidiary the Tao bakeries.

The schedule of expected cash receipt for the company is given in the table below.

Forecast sales

This initial entry is merely notational. It has been provided as an aid in calculating sales related items.

Cash sales

The cash sales shown for each month represent 20 percent of the sales forecast for that month. These entries represent the collection of account receivable resulting from sales in earlier months.

Lagged One Month
These figures represent sales made in proceeding month that generated account receivable collected in the current month. Since 50 percent of the month sales are collected one month later the collection of account receivable with a one month Lagged shown for September, October, November and December represent 50 percent of the sales in August, September, October and November respectively.

A schedule of project cash receipt for Mifo Goods Company (₦000)

		Aug		**Sept**	**Oct**	**Nov**	**Dec**
Forecast sales		100		₦200	₦400	₦300	₦200
Cash sales	(.20)	20		40	80	60	40
Collections:							
Lagged one month		(.50)	-	50	100	200	150
Lagged two months		(.30)	-	-	30	60	120
Other cash receipt		-	-	-	-	30	
Total cash receipt		-	-		210	320	340

Lagged two months: these figures represent sales made two months earlier that generated account receivable collected in the current month. E.g. the collection shown for October represents 30% of the sales in August etc.

Other cash receipt: These are cash receipt expected to result from sources other than sales. Items such as dividend, interest received; proceed from the sale of equipment, stock and bond proceeds and lease receipts may show up here. For the Mifo Goods Company the only other cash receipts are the N30,000 dividends due in December.`

Total cash receipts: This figure represents the total of all the cash receipt item listed for each month in the cash receipt schedule. In the case of the Mifo Goods Company we are concerned with only October, November and December. The total cash receipt for these months are as shown.

Cash Disbursement
Cash disbursement includes all outlays of cash in the period covered, the most common cash disbursements are;

- Cash purchases
- Payments of accounts payable
- Payments of cash dividends
- Rent
- Wages and salaries
- Tax payments
- Capital additions
- Interest additions
- Interest on debt
- Repayment of loan and sinking fund payment
- Repurchase or retirement of stock

EXAMPLES

The Mifo Goods Company discussed in the preceding example has gathered the following data needed for the preparation of a cash disbursement schedule for the month of October, November and December.

1) **Purchases:** the firm's purchase represent 70 percent of their sales; 10 percent of this amount is paid in cash 70 percent is paid in the month immediately following the month of purchase, and the remaining 20 percent is paid two months following the month purchase
2) **Cash dividends:** cash dividends of ₦20,000 will be paid for October.
3) **Rent:** rent of ₦5,000 will be paid each month.
1) **Wages and salaries:** The firm's wages and salaries can be calculated by adding 10 percent of its monthly sales to the ₦8,000 sales fixed cost figure.
2) **Tax Payments:** Taxes of ₦25,000 must be paid in December.
3) **Capital Additions:** A new machine costing ₦130,000 will be purchased and paid for in November.
4) **Interest payments:** An interest payment of ₦10,000 is due in December
5) **Sinking fund payment:** A ₦20,000 sinking fund payment is also due in December.
6) **Repurchases or retirement of stock:** no repurchase or retirement of stock is expected to occur during the October, December period.

The firm's cash disbursement schedule based on data above is presented below:

A SCHEDULE OF PROJECTED CASH DISBURSEMENT FOR THE MIFO GOODS COMPANY ('000, OMITTED)

		Aug	**Sept**	**Oct**	**Nov**	**Dec**
Purchase (.70 sales)		₦70	₦140	₦280	₦210	₦140
Cash purchases (.10)	₦7	₦14	₦28	₦21	₦14	
Payments:						
Lagged one month (.70)		-	49	98	196	147
Lagged two months (.20)		-	-	14	28	56
Cash dividends		-	-	20	-	-
Rent expenses	-	5	5	5	5	
Wages and salary		-	-	48	38	28
Tax payments	-	-	-	-	25	
Capital addition		-	-	-	130	-
Interest payment		-	-	-	-	10
Sinking fund payments		-	-	-	-	20
Total cash disbursement				₦213	₦418	₦305

Purchases: This entry is merely notational. The figure represents 70 percent of the forecast sales for each month. They have been included at the top of the exhibit to facilitate the calculation of the cash purchases and related payments.

Cash Purchases: The cash purchases for each month represent 10 percent of the month's purchases.

Payments: These entries represent the payment of accounts payable resulting from purchases in earlier months.

Lagged One Month: These figures represent purchases made in preceding months that are paid for in the current month. Since 70 percent of the firm's purchases are paid for one month later, the payment lagged one month shown for September represent 70% of the August sales etc.

Lagged Two Months: These figures represent purchases made two months earlier that are paid for in the current month. The payment shown for October represents 20 percentages of the August purchases etc.

Wages and Salaries: These values were obtained by adding N8,000 to 10 percent of the sales in each month. The N8,000 represents the salary components, the rest represent wage. The remaining items on the cash disbursement schedule are self explanatory.

THE NET CASH FLOW, ENDING CASH FINANCING

A firm's net cash flow is found by subtracting the cash disbursement from cash receipts in each month. By adding beginning cash to the firm's net cash flow the ending cash for each month can be found.

Finally, any financing necessary to maintain predetermined minimum cash balance must be added to ending cash in order to get ending cash with financing.

The table below presents the Mifo Goods Company's cash budget based on the cash receipt and cash disbursement data already developed for the firm. The firm's end of September cash balance was N50,000 and it wishes to maintain a minimum cash balance of N25,000

A Cash Budget for the Mifo Goods Company ('000)

	Oct	**Nov**	**Dec**
Total cash receipts	₦210	₦320	₦340
Less: Total Cash disbursement	213	418	305
Net cash flow	₦(3)	₦(98)	₦35
Add: beginning cash (Ending cash for Sept)	50	47	(51)
Ending cash	₦47	₦(51)	₦(16)
Add financing	0	76	41
Ending cash with financing	₦47	₦25	₦25

In order for this company to maintain its required ₦25,000 ending cash balance, it will need to have borrowed ₦76,000 in November and ₦41,000 in December. The financing figure in the cash budget refer to "how much will have to be owed at the end of the month". They do not show the additional borrowing required during the month.

Interpreting the Cash Budgets

The cash budget provides the firm with figures indicating the expected ending cash balances, which can be analyzed to determine whether a cash shortage or cash surplus is expected to result in the month covered by the forecast. The Mifo Company can expect a surplus of ₦22,000 (₦47,000-

₦25,000) in October, a deficit of ₦76,000 in November and a deficit of ₦41,000 in December. Each of these figures is based on the internally imposed requirement of a ₦25,000 minimum cash balance.

The excess funds in October can be invested in marketable securities. The deficits in November and December will have to be financed by borrowing-typically short-term borrowing up to ₦76,000 for the three months period evaluated, the financial manager should be sure that a line of credit is opened or some other arrangement is made to assure the availability of these funds. Typically the financial manager will request or arrange to borrow more than the ending cash values which are on the sales forecast and other forecast values.

CHAPTER VII

FINANCIAL FORECASTING
PROFORMA STATEMENT

The planning process is an integral part of the financial manager's job. Long-term debt and equity funds are raised infrequently and in large amounts primarily because the cost per N1 raise by selling such securities decreases as the size of the issue increase. Because of these considerations, it is important that the firm has a working estimate of its total needs for the few years.

Proforma statements are projected financial statement. The firm's proforma income statement shows its expected revenue and cost for the coming year, while its proforma balance sheets shows its projected financial position (i.e. its assets, liabilities and stockholders equity) at the end of the forecast period. Proforma statements are used for evaluating the firm's future performance. Not only are they useful for internal control, but lenders commonly use them in analyzing a firm before making a loan or deciding to maintain a line of credit. Quite often ratio analysis is performed on proforma statements in order to evaluate the firms expected financial position and sources and uses of funds statement based on the proforma statements are prepared. Proforma statements differ from the cash budget in that they provide estimate not just of future cash requirement but of all assets, liabilities, equities and income statement item.
There are various methods used for forecasting financial requirement and these includes:

i. Scatter diagram or least square regression methods
ii. Curvilinear simple regression method
iii. Multiple regression method
iv. Percentage of sales method

We are going to consider the simplest approach which is the percentage of sales method.

PERCENTAGE OF SALES METHOD
The most important variable that influences a firm's financing requirement is

It's projected monetary volume of sales. Goods sales forecast is an essential foundation for forecasting financial requirements. Here we shall simply assume that a sales forecast has been made, then we estimate financial requirements on the basis of this forecast.
The simplest approach of forecasting financial requirement expressed the firm's needs in terms of the percent of annual sales invested in each individual balance sheet item. As examples consider the Mifo Company, whose balance sheet as at December, 1986 is shown below.

The company's sales are running at about N500,000 a year, which is its capacity limit, the profit margin after tax on sales is 4 percent. During 1986 the company earned N20,000 after taxes and paid out N10,000 in dividends and it plans to continue paying out half of net profit as dividend. However, additional financing will be needed if sales expanded to N800,000 during 1987.

The calculation procedure, using the percentage of sales method is explained below:

The Mifo Company Balance Sheet 31 December, 1986

Liabilities (N)	**Assets (N)**

Ordinary share capital	100,000	Fixed assets (net)	50,000
Retained earnings	100,000	Stock	100,000
Long term loans	70,000	Debtors	85,000
Accrued expenses	25,000	Cash	10,000
Trade Creditor	50,000		
	345,000		345,000

First, isolate those balance sheet items that ca be expected to vary directly with sales. In this case of the Mifo Company, this step applies to each category of assets; a higher level of sales necessitates more cash for transactions, more debtors, higher stock levels, and additional productive capacity. On the liability side, trade creditors as well as accruals may be expected to increase with increase in sales. Retained earnings will go up as long as the company is profitable and does not payout 100 percent of earnings, but the percentage increase is not constant. However, neither ordinary share capital nor long term loans would increase spontaneously with an increase in sales. The items that can be expected to vary directly with sates are tabulated as a percentage of sales as shown below:

The Mifo Company Balance Sheet Items Expressed as a Percentage of Sales 31st December 1986

Liabilities	**(%)**	**Assets**	**%**
Ordinary share capital	N.A	Fixed assets(net)	30.0
Retained earnings	N.A	Stock	20.0
Long term loans	N.A	Debtors	17.0
Trade Creditor	10.0	Cash	2.0
Accrual expenses	5.0		69.0
	15.0		
Asset as percentage of sales			69.0
Less spontaneous increase in liabilities			15.0
Percentage of each additional ₦1 for sales			-
That must be financed			54.0

Note: N/A=Not Applicable

Foe every ₦1.00 increase in sales, assets must increase by ₦0.69. this ₦0.69 must be financed in some manner. Trade creditor will increase spontaneously with sales, as with accruals, these two items will supply ₦0.15 of new funds for each ₦1 increase in sales. Subtracting the 15 percent for spontaneously generated funds from the 69 percent funds requirement leaves 54 percent. Thus for each increase in sales, the Mifo Company must obtain ₦0.54 of financing either from retained earnings or from external sources.

In the case at hand, sales are schedule to increase from ₦500,000 to ₦800,000 or by ₦300,000. Applying the 54 percent developed above, to the expected increase in sales leads to the conclusion that ₦162,000 will be needed. Some of that need will be met by retained earnings. Total sales during 1987 will be ₦800,000. If the company earns 4 percent after taxes on this volume profits will amount to ₦32,000.

Assuming that the 50 percent dividend payment ratio is maintained dividends will be ₦16,000 and ₦16,000 will be retained. Subtracting the retained earning from the amount of funds that must be

obtained through borrowing or by selling new shares, the external fund needs is ₦146,000, this process may be expressed in equation form.

External funds needed = $\frac{A}{TR}(\Delta TR) - \frac{B}{TR}(\Delta TR) - bm(TR2)$

Where:

A/TR = Assets that increase spontaneously with sales as a percentage of sales,
B/TR = Those liabilities that increase spontaneously sales as a percentage of sale
□TR = Change in total revenue
M = Profit margin on sales
TR2 = Total sales projected for the year
b = Earning retention ratio

For Mifo Company then, External funds needs
= 0.69 (N300,000) – 0.15 (300,000) – 0.04 (800,000) 0.50
= 0.54 (300,000) – 0.02 (N800,000) = N146,000
The N146,000 found by the formula method must of course equal the amount derived previously

This same answer can be obtained straight away by preparing the company's Pro-forma Balance Sheet for 1987, given that 1987 sales amounted to N800,000, then we multiply this amount by the percentage for each items arrived at in the previous balance sheet, to get the Pro-forma Balance Sheet; where it is not applicable you transfer the amount in the previous balance sheet.

Mifo Company Proforma Balance Sheet: 31 December, 1987

Liabilities (N)		**Assets (N)**	
Ordinary share capital	100,000	Fixed assets (net)	240,000
Retained earnings	116,000	Stock	160,000
Long term loans	70,000	Debtors	136,000
Accrued expenses	80,000	Cash	16,000
Trade Creditor	40,000		
Additional Financial For 1987	146,000		
	N552,000		N552,000

The Proforma Balance Sheet must balance, the difference between the two sides N146,000 in this case is the additional financing requirement for 1987 which we said can be obtained through borrowing or by selling new ordinary shares.

Let us assumed that this company has an agreement with the bond holders to keep total debt at or below 50% of total assets, what are the financing choices of this company?

Restriction on Additional Debts 1987:
Maximum debt permitted 50% x 552,000 = 276,000
Debt projected for 1987:

Trade Creditors	80,000		
Accrued expenses	40,000	=	120,000
Maximum additional			
Debt that can be borrowed		=	156,000
There is no common equity requirement ₦146,000 – 156,000=			(₦10,000)

This is because the additional financing required is less than the maximum additional debt that can be borrowed. As a result the additional financing required will be sourced wholly through the debt option.

PROFIT PLANNING

Cost-Volume Profit Analysis: Cost-Volume Profit (CV) analysis is an analytical technique for studying the relationship between volume, cost (fixed and variables), prices and profits. It is a device used to determine the usefulness of the profit planning process of the firm.

As a starting point in the profit planning, (CVP) help to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. Generally, CVP analysis provides answers to questions such as:

i. What minimum level of sales need be achieved to avoid losses?
ii. What will be the effect of changes in prices, cost and volume on profits.
iii. What should be the sales levels to earn a target profit?
iv. How will profits be affected when sales mix is changed?
v. What will be new break-even point under (3) and (4) above?
vi. What will be the impact of plant expansion on cost-volume profit relationship?
vii. Which product is the most profitable and which one is the less profitable?
viii. Should the sale of a product or operation of a plant be discontinued?
ix. Should or not the firm be shut down temporarily and so on?

The CVP analysis is of immense utility to management as it provides an insight into the effects and inter-relationship of the factors which influence the profit of the firm.

BREAK-EVEN ANALYSIS:

The break-even analysis is the most widely known form of the CVP analysis, for this reason, the terms are used interchangeably by many people. The break-even analysis establishes a relationship between revenue and costs with respect to volume. It indicates the level of sales at which cost and revenues are in equilibrium. The equilibrium point is commonly known as that point of sales volume at which total revenue is equal to total costs. It is a non-profit no loss point. It should be noted, however, that the breakeven point is just incidental in CVP studies. The more significant aspect of the CVP analysis is to examine the effects of changes in costs, volume and prices on profits.

In order to be able to use CVP or break-even analysis the costs must be separable into fixed and variable cost. For the breakeven point to occur, it is necessary that the firm has some variable costs and some fixed cost. If all the costs of the firm were variable, no profit no loss situation would arise at zero sales volume and profits would vary proportionately with sales. On the other hand, if all costs were fixed the break-even point would occur at a point where revenues are equal to total fixed costs and afterwards profits would be equal to the sales revenues.

DETERMINING THE BREAK-EVEN POINT

Two approaches can be used to compute the break-even point: The formula approach and (2) the chart approach.

Break-even Formula: The BEP can be computed in terms of unit, or in terms of money (naira) value of sales volume.

1. IN UNITS: The BEP may be calculated for a single firm in terms of units of product. The BEP in terms of units will be reached when the units sold-create sufficient revenue to cover their total costs-fixed and variable. Each unit of the product sold will cover its own variable costs. Note that contribution per unit is the difference between selling price per unit and variable cost per units sold, and profit is derived when fixed costs are subtracted from total contribution thus:

Selling Price per Unit – Variable Cost per unit

Unit contribution

= Unit contribution x Unit Sold = Total Contribution.

Total Contribution – Fixed Costs = Profit

Illustration:

Assuming that a manufacturing firm produces a single product whose selling price is ₦20 per unit and the variable costs per unit are ₦12. The annual fixed costs of the firms are estimated at ₦160,000. Thus, to break-even the firm's total contribution from the sale of the units of product should be equal to the fixed cost of ₦160,000. As the sale of one unit of product produces a marginal income or contribution of ₦8, (SP/u VC/u) the firm must sell 20,000 units to realize a total contribution of 160,000 to cover the fixed costs. The fact that the firm's profit is equal to zero at a sales volume of 20,000 units is verified as follows;

Sales revenue (20,000 units @ ₦20)	₦400,000	
Less variable cost (20,000 units @ ₦12)		₦240,000
Contribution		₦160,000
Less fixed costs		₦160,000
Profit		NO

It can be seen from the illustration above that the break-even point in terms of units can be computed by dividing fixed costs by contribution per unit mathematically, it may be expressed as follows:

$$QB = \frac{F}{S-V}$$

Or

Break-even point (units)

$$= \frac{\text{Fixed costs}}{\text{Selling price per unit} - \text{Variable cost per unit}}$$

It can be observed from Eq… (1) that it is necessary if a positive break-even point is to occur that the selling price be greater than the variable cost per unit (i.e S>V). mathematically, if the selling price is less than the variables cost per unit (S>V), a solution for break-even points in terms of negative sales volume does exit; but the negative sales volume in practice is an unacceptable solution. In case selling price equals variable cost per unit (S = V), no break-even point can exist unless the firm has zero fixed cost situation, every sales volume point will be a break-even point, because revenue would be exactly equal to total costs at any sales volume.

2. NAIRA BREAK EVEN POINT:

The break even point for a single product firm can also be calculated in terms of the naira value of sale volume. If both side of EQ (1) are multiplied by the selling price, we will get the break even solution in terms of Naira thus:

$$NB = QB \times S = \frac{(F)S}{S-V}$$

$$\text{OR B/E point (Naira)} = NB = \frac{F}{1 - \frac{V}{S}} \qquad \text{……..(2)}$$

Where:

NB represents the break-even sales revenue. Substituting the data in our illustration into Eq (2), we get

$$\text{B/E point (Naira)} = \frac{₦160,000}{1 - \frac{₦12}{₦20}}$$

$$= \frac{160,000}{\frac{8}{20}} = \frac{160,000 \times 20}{8} = ₦400,000$$

The same answer could be obtained by multiplying the break-even unit by the selling price (20,000 x ₦20 = ₦400,000). The advantage of this formula is that it can be used both with the per unit information and the total information. This is so because the variable cost to sales ratio will remain the same for any sales volume as both variable cost and sales revenue change in direct proportion to sales volume.

Using total sales and total variable cost information Eq (2) is particularly significant for the multiple product firms. These firms find difficulties in measuring volume in term of any common unit in term of total naira sales.

MULTIPLE PRODUCT BREAK EVEN POINT:

The break-even point for a multiple product firm can be calculated using Eq (2)

$$NB = \frac{F}{1 - V}$$

S

Or

Break-even point (Naira)

$$= \frac{\text{Fixed costs}}{1 - \frac{\text{Total variable cost}}{\text{Total sales revenue}}} \quad \text{.....Eq(3)}$$

Illustrations:

A firm has the following budget data for the year ending 31st December 1983

Budget Sales	-	₦500,000
Budgeted variable cost	-	₦300,000
Budgeted fixed cost	-	₦100,000

Break-even point for this firm will be

$$\text{B/E point (Naira)} = \frac{100{,}000}{1 - \frac{₦300{,}000}{₦500{,}000}}$$

$$= \frac{₦100{,}000}{1 - \frac{3}{5}}$$

$$= \frac{100{,}000}{1 - 6}$$

$$= \frac{100{,}000}{0.4}$$

$$= ₦250{,}000$$

Proof:

Sales revenue		₦250,000
Variable cost	(₦250,000 x .6)	150,000
Contribution	(₦250,000 x .4)	100,000
Fixed cost		100,000
Profit		NO

P/V OR CONTRIBUTION RATIO:

A careful look at equation (2) and (3) and the last illustration provides an insight into the mechanism of the break-even point when the variables cost (per unit or total) are divided by sales (selling price or total), we get variable cost ratio. Thus, the 0.60 or (₦300,000/500,000) derived in the last illustration shows that variable costs are 60% of sales, or stated in other words ₦0.60 of every one Naira sales is require to cover the variable cost. We derive the profit volume (PV) ratio or the marginal income or contribution, ratio when the variable cost ratio is subtracted from one. Thus, the denominator in Eq (2) or Eq (3)

$$1 - \frac{\text{Variable Cost}}{\text{Sales}} = \text{P/V or contribution ratio.}$$

For example, the .40 (i.e. 1 - .6) derived from our last illustration shows that 40% of sales are available to cover fixed cost and generate profits. In other words to cover fixed costs and earn a profit. Since profit at the break-even point is zero, dividing fixed costs by the PV ratio gives the sales volume that is necessary to recover total fixed costs (₦100,000/.4 = ₦250,000). Thus Eq (2) or Eq (3) can be

Written as follows:

$$\text{B/E point (Naira)} = \frac{\text{Fixed Cost}}{\text{P/V or contribution ratio}} \quad \text{……..Eq (4)}$$

$$\text{Note that PV ratio} = \frac{\text{Variables Costs}}{1 - \text{Sales}}$$

(3) AS A PERCENTAGE OF CAPACITY

Many firms are interested in computing the break-even point as a percentage of the estimated sales or capacity.
This can be done by dividing the capacity sales by the break-even sales.

For example, in our first illustration, if the firm is assumed to have an estimated capacity of 50,000 units of product, its break-even point of 20,000 unit is reached at 40 percent of the capacity (20,000/50,000).

Similarly in our second illustration the break-even point as a percentage of capacity is 50 percent (₦250,000/500,000). The break-even point as a percentage of estimated capacity can be determined directly if information for the total marginal income or contribution is available. The formula is:
BEP (as percentage of capacity).

$$= \frac{\text{Fixed Costs}}{\text{Total Contribution}} \quad \text{…….. Eq (5)}$$

Margin of Safety:
The excess of actual or budgeted sales over the break-even sales is known as the margin of safety. The margin of safety can be expressed as a percentage of sales.

$$\text{Margin of Safety ratio} = \frac{\text{Budget Sales} - \text{B/E Sales}}{\text{Budget Sales}}$$

For example if a firm budget sales is ₦20,000 and B/E Sales = ₦10,000 then its M/S ratio = $\frac{₦20,000 - ₦10,000}{₦20,000}$ = 50 or 50%

The margin of safety indicates the extent to which sales may fall before the firm suffers a loss. The larger the margin of safety, the safer the firm.

BREAK-EVEN ANALYSIS AND PROFIT GOAL:

It is important to realize that once the firm has reached the break-even point, the difference between sales in excess of the break-even sales and the variable costs (the difference is the contribution from sales in excess of the break-even sales) is the firm's profit. The reason is that the fixed costs have been already covered at the break-even point. Therefore, any extra sales will simply add to the profit (after deducing the variables costs).

The profit rate on sales in excess of the break-even will be equal to the PV ratio (marginal income or contribution ratio). The implication of the above reasoning is that, when profit is divided by the PV ratio, the amount of sales in excess of the break-even sales is obtained. This logic can be extended to compute the sales volume necessary to earn desired level of profit. To earn a desired amount of profit, the total contribution should be enough to cover total fixed cost and leave the desired amount of profit. Thus, sales volume (to earn desired amount of profit) is;

$$\frac{\text{Fixed cost} = \text{Desired profit}}{\text{PV or contribution ratio}}$$

The profit goal may be stated in terms of profit after taxes. In such a case, sales volume (to earn desired amount of profit) is;

$$\frac{\text{Fixed cost} + \dfrac{\text{Desired after tax profit}}{1 - \text{Tax rate}}}{\text{PV or contribution ratio}}$$

We know that the amount of sales in excess of the break-even sales is known as the margin of safety. Thus, if we multiply the Margin of Safety by the PV ratio, we will get the amount of profit.

Similarly, we shall obtain the profit margin ratio (i.e. profit divided by sales), if we multiply PV ratio and M/S ratio.

Thus, Profit margin = PV ration x M/S ratio

$$\text{PV ratio} = \frac{\text{Profit margin}}{\text{M/S ratio}}$$

$$\text{M/S ratio} = \frac{\text{Profit Margin}}{\text{PV ratio}}$$

Illustration:
Suppose that the firm in our last illustration wants to earn an after tax profit of ₦54,000 and that the income tax is 40 percent. To earn 54,000 after tax profit the sales volume have to be:
Sales volume (to earn after – tax profit of ₦54,000)

$$\frac{100{,}000 + \dfrac{54{,}000}{1 - .4}}{.4}$$

$$= \frac{₦100{,}000 + 90{,}000}{.4} = ₦475{,}000$$

Proof:

Sales revenue	₦475,000

Variable costs (60% of sales)	285,000	
Marginal contribution (40% of sales)	190,000	
Fixed costs		100,000
Profit before taxes		90,000
Income tax (40%)		36,000
Profit after taxes		54,000

OPERATING LEVERAGE

In general terms, leverage may be defined as relative change in profit due to a change in sales. A high degree of leverage implies that a large change in profits occur due to a relatively small change in sales. Operating leverage refers to the use of fixed costs in the operation of the firm. A firm has a higher degree of operating leverage if it employs a greater amount of fixed costs (and a small amount of variables costs). On the other hand, if the firm (incurs a greater amount of variables costs) and employ small fixed cost, it has a low degree of operating leverage. The profits of a highly leverage (operating) firm will increase at a faster rate than the increase in sales. However, if the sales fall, the firm with a high degree of operating leverages will suffer a greater loss than a firm with low or moderate degree of operating leverage.

Degree of Operating Leverage:

The degree of operating leverage is defined as the percentage change in profits resulting form a percentage change in sales. In the equation form operating leverage may be expressed as follows:

$$\text{Degree of operating leverage} = \frac{\text{Percentage change in Profit}}{\text{Percentage change in Sales}}$$

Cost volume Profit Analysis for a Multiple Product Firm:

We have assumed so far that the firm is producing only one product, or if a number of products are manufactured by the firm, the sales mix is constant. In the case of a multi-product firm, contribution for each product can be found out by deducing its variable costs from the sales revenue. The break-even point for each product can be calculated only if the total costs of the firm are distributed. As the fixed costs are generally given for the firm as a whole, the firm's break-even point can be calculated by dividing the fixed cost by the P/V ratio for the firm.

$$\text{B/E Point} = \frac{\text{Fixed Costs}}{\text{PV ratio (for the firm)}}$$

The multiple product firms' PV ratio will be the weighted average of the PV ratios for all products. The weights being the relative proportion of each product's sales. The P/V ratio for the multi product firm can also be calculated by dividing the total contribution from all products by the total sales.

Illustration:

The following information relate to Mifo Company for the period ending 31st March, 1978

	Product		
	X	**Y**	**Z**
Sales	N200,000	N300,000	N500,000

Variables cost	120,000	210,000	350,000

If the fixed costs are N152,000, find out the firm's break-even point and profit. Also compute the PV ratio for each product.

Calculation of B/E Point and P/V Ratio for a multiple Product Firm (Mifo Company)

Product	**X**	**Y**	**Z**	**Total**
Sales Mix	20%	30%	50%	100%
Sales revenue	N200,000	N300,000	N500,000	1,000,000
Variables costs	N120,000	N210,000	N350,000	680,000
Contribution	N80,000	N90,000	N150,000	320,000
Fixed cost				52,000
Net profit				N160,000
P/V ratio	40%	30%	30%	32%
B/E point		=	152,000 ÷ 0.3	2 = 475,000

The firm's PV ratio in this example is 32 percent i.e. N320,000/N1,000,000. This is the weighted average of the PV ratios for individual products i.e. 20 percent x 40 percent + 30 percent x 30 percent + 50 percent x 30 percent = 32 percent

Assumption Underlying CVP or B/E Analysis

The discussion of the break-even analysis so far is based on the following assumptions:

1. The total cost can be separated into fixed and variable component
   a. That the total fixed cost remains unchanged with changes in sales volume
   b. That the variable cost per unit is constant and the total variable cost changes in direct proportion to sales.
2. The selling price per unit remains constant, that is, it does not change with volume or because of the other factors
3. The firm manufactures only one product or if there are multiple products, the sales mix does not change
4. Production and sales are synchronized, that is inventories remain the same.

Limitations of CVP or B/E Analysis

The assumption of the CVP analysis limits the utility and general applicability and makes it rather unrealistic. As a result, the analysis should recognize these limitations and adjust the data wherever possible to get meaningful results. The cost volume profit analysis suffers from the following limitations.

1. It is difficult to separate costs into fixed and variable components.
2. It is not correct to assume that total fixed cost would remain unchanged over the entire volume range.
3. The assumption of constant selling price and unit variables cost is not valid.
4. It is difficult to use the break-even analysis for a multi-product firm.
5. The break-even analysis is a short-term concept and has a limited use in long-term planning.

6. The break-even analysis is a static tool it shows the relationship between costs, volume and profit of a firm at given point in time.

Operating and Financial Leverages

The term leverage is quite commonly used to describe the firm's ability to use fixed cost assets or funds to magnify the return to its owners. Increasing leverage increases the uncertainty of returns. While at the same time Increasing the size of the possible return. Leverage occurs in varying degrees, the higher the degree of leverage the higher the risk but the higher the expected return. The term risk in this context refers to the degree of uncertainty associated with the firm's ability to cover fixed payments obligations. The amount of leverage in the firm's structure greatly reflects the types of risk return trade off it makes. There are two types of leverage in most business firms- operating leverage and financial leverage. The former is due to fixed cost associated with the production of goods or services, where as the later is due to the existence of fixed financing cost, in particular, interest on loan. Both type of leverage affect the level and variability of after tax earning and hence, the overall risk of a company.

An Income Statement Approach to Leverage:

The two types of leverage can best be defined with reference to the firm's income statement. Table 1 present a typical income statement format. The portion of the statement related to the firms operating leverage and the portion related to its financial leverage are clearly labeled.

OPERATING LEVERAGE is determined by the relationship between the firms sales revenue and its earning before interest and taxes. (Note the firms earnings before interest and taxes are often referred to as operating profit. Earning before interest and taxes are used as the pivoted point in defining operating and financial leverage since they divide the operating and financial portion of the firms income statement) FINANCIAL LEVERAGE is determined by the relationship between the firms earning before interest and taxes and the earnings available for common stock holder.

Table 1: **A general income statement format**

Operating Leverage	Sales revenue
	Less: cost of goods sold
	Gross profits
	Less Operating expenses
	Earning before interest and taxes (EBIT)
Financial Leverages	Less Interest
	Earning before Taxes
	Less: Taxes
	Earning after taxes
	Less: Preferred stock dividends
	Earnings available for common stockholder

OPREATING LEVERAGE

An operating leverage occurs any time the firm has fixed cost that must be met regardless of volume. In the very long run, all costs are variable. Consequently, our analysis necessarily involves the short run. We employ assets with a fixed cost in the hope that volume will produce revenues more than sufficient to cover all fixed and variables costs.

The essential thing is that fixed cost does not vary as volume changes. These costs includes such things as depreciation of buildings and equipment, insurance, property taxes, part of the overall utility bills and part of the cost of management. On the other hand variable costs vary directly with the level of output. These cost includes raw materials, direct labour costs, part of the overall utility bills, direct selling commission and certain part of general and administration expenses. With fixed cost the percentage change in profits accompanying a change in volume is greater than the percentage change in volume. The phenomenon is known as Operating Leverage.

It is important to recognize that operating leverage is but one component of the overall business risk of the firm. The principal factors giving rise to business risk are uncertainty with respects to sale demand and uncertainty with respect to the costs of production. Operating leverage magnifies the impact of these factors on the variability of profits. However, operating leverage is not the sources of the variability. Consequently, the degree of operating leverage of firm should not be taken to represent its business risk. Given the underlying variability of sales and costs of a firm, however, increases in operating leverage will increase the total variability of profits and hence, increase the company's business risk. Operating leverage may be illustrated thus:

Illustration:
A firm sells its product for ₦10 per unit, has variable operating costs of ₦5 per unit, and has fixed operating costs of ₦2,500 per year. Table 2 shows the various levels of earning before interest and taxes (EBIT) that would result from sales of 500, 1,000 and 1,500 units respectively. If sales of 1,000 units are used as a basis for comparison, the following two cases result:

Table 2: EBIT for Various Sales Levels

	Case 1		**Case 2**
	+50%		-50%
Sales	1,500	1,000	500
Sales Revenue (a)	₦15,000	₦10,000	₦5,000
Less: variable operating cost (b)	₦7,5005,000	2,500	
Gross profit	7,500	5,000	2,500
Less fixed operating costs	2,500	2,500	2,500
Earnings before interest			
And taxes (EBIT)	₦5,000	₦2,500	₦0.0
	+100%	-100%	

a = Sales revenue = ₦10/unit x sales in units
b = Variable operating costs = ₦5/unit x sales in units.

Case 1: A 50% increase in sales (from 1,000 to 1,500 units) results in a 100 percent increase in earnings before interest and taxes from (2,500 - ₦5,000).

Case 2: A 50% decrease in sales (from 1,000 to 500 units) result in a 100 percent decreases in earning before interest and taxes form (2,500 to zero).

These two cases illustrate the fact that operating leverage works in both directions and that when a firm has fixed operating costs, operating leverage is present. An increase in sales results in a

greater than proportional increase in earnings before interest and taxes, while a decrease in sales results in a more than proportional decrease in earning before interest and taxes.

Whenever there are fixed operating costs operating leverage exists. Another way of defining operating leverage is given by equation 1.

$$\frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}} > 1 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Whenever the percentage change in EBIT resulting from a given percentage change in sales is greater than the percentage change in sales, operating leverage exist. Applying Equation 1 to case 1 and case 2 yield the following results:

Case 1: $\frac{+100\%}{+50\%} = 2$

Case 2: $\frac{-100\%}{-50\%} = 2$

Since the resulting quotient is greater than 1 operating leverage exists. For a given level of sales, the higher the value resulting from applying. Equation 1, the greater the operating leverage.
Operating leverage may be studied by means of a break-even or cost volume profit analysis.

BREAK-EVEN ANALYSIS

Break-even analysis or cost volume profit analysis is closely related to the concept of operating leverage. It allows the firm (1) to determined the level of operations it must maintain to cover all its operating costs and (2) to evaluate the profitability or unprofitability of various level of sales. Break-even analysis can be performed algebraically or graphically.

At the break-even point, variable costs plus fixed costs equal total revenue

$$F + V(S) = P(X) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:
F = fixed operating cost
V = variable operating cost per unit
X = Sales volume in units
P = Price per unit
Re-arranging Eq. (2), the break-even point is

$$X = \frac{F}{P - V} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The formula of the break-even point can also be arrive at if we note that:

$$EBIT = P(X) \quad F + V(X) \quad \ldots..\ldots\ldots (4)$$

Simplifying Eq (4) yield: $EBIT = X(P - V) - F$ …….. (5)

The firm's break-even paint is defined as the level of sales at which all fixed and variables operating cost are covered, that is the level at which EBIT equal zero. Setting EBIT equal to zero and solving equation 5 for the firm's sales volume, X, yields.

$$X = \frac{F}{P - V}$$

This equation is used to find the firm's break-even volume X. (It is the same with Eq.3)

EXAMPLE

Assume that the firm described in the example of operating leverage gas fixed operating costs of 2,500 that the sale price per unit of its product was ₦10 and that its variables operating cost per unit was ₦5, applying equation 3 to this date yields.

$$X = \frac{₦2{,}500}{₦10 - ₦5} = \frac{2{,}500}{₦5} = 500\text{units}$$

At sales of 500units or ₦5,000 (i.e. ₦10 x 500 units), the firms EBIT should just equal zero. A look at the third column of table 2 confirms this expectation.

In the preceding example, the firm will have positive EBIT for sale greater than 500 units and negative EBIT or loss for sales less than 500 units. Note that the closer the volume to the break-even point, the greater the percentage change in EBIT in relation to a percentage change in volume.

The degree of operating leverage of a firm at a particular level of output is simply the percentage change in profits over the percentage change in output (sales) that causes the change in profits. This, degree of operating leverage at

X units = percentage change in profits thus:

Degree of operating leverage at X units

$$= \frac{\text{Percentage change in profit}}{\text{Percentage change in output (sales)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Rather than calculate the percentage involved directly a simple formula is available for expressing the relationship:

$$\text{DOL at X units} = \frac{X(P - V)}{X(P - V) - F}$$

Suppose that we wished to determine the degree of operating leverage at 1,000 units of output for our hypothetical example firm:

$$\text{DOL at 1,000 units} = \frac{1{,}000(10 - 5)}{1{,}000(10 - 5) - 2{,}500}$$

$$= 2.0$$

For 1,500 units of output, we have

$$\text{DOL at 1,500 units} = \frac{1{,}500(10 - 5)}{1{,}500(10 - 5) - 2{,}500} = 1.5$$

We see, then, that the farther the level of output is from the break-even point, the lower the degree of operating leverage. The greater the degree of operating leverage, for a given level of output, the more the profit vary with variations in output.

The Graphical Approach:

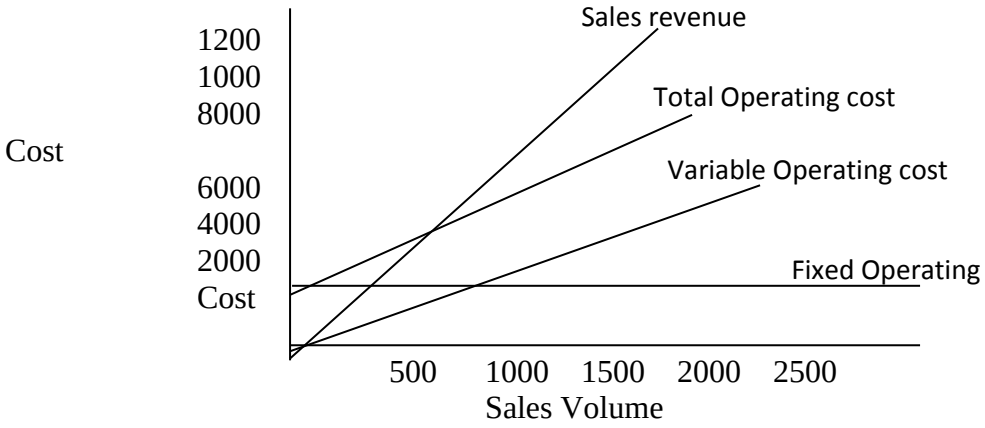
The firm's break-even point can be calculated graphically. Figure 1 present graphical break-even analysis of the data in the preceding example. In figure 1 the firm's break-even point is the point where its total operating cost equals it sales revenue. A firm's total operating cost is defined as the sum of its fixed and variables operating costs, using the notation introduced earlier. We can define the equation of the total operating cost as follows:

Total operating cost = F + V (X)

Also depicted in figure 1 are the firm's fixed and variable operating costs. The general cost characteristics defined earlier are exhibited by the lines representing each of these costs.

Figure 1 show that a loss occurs when the firm's sales are below the break-even point. For sales of less than 50 units (₦500), the firm's total operating costs exceed its sales revenue. For sale level greater than the break-even point, EBIT are greater than zero. The absolute amount of the loss increase as the level of sales decreases from the break-even point, the absolute amount of EBIT increases as the level of sales increases beyond the break-even point.

Changing cost relationships and the break-even point:



A firm's break-even point is sensitive to a number of variables specifically, fixed operating costs, the sales price unit, and the variable operating cost per unit. The effects of increases or decreases in each of these variables on the break-even point are examined below.

Change in fixed operating costs: An increase in the firm's fixed operating cost will increase its break-even point, and a decrease in its fixed operating cost will lower its break-even point. Consider the preceding example. If we increase the fixed operating costs from 2,000 to ₦3,000 the calculation using Equation 3 would be:

$$\frac{₦3{,}000}{₦10 - ₦5} = 600 \text{ units}$$

If we decrease the fixed operating costs to ₦2,000
The break-even point would be:

$$\frac{₦2,000}{₦10 - ₦5} = 400 \text{ units}$$

Changes in the firm's fixed operating cost have an even more significant effect on the firm's operating leverage. We stated earlier that the higher the level of fixed operating costs, the higher the degree of operating leverage Table 3 shows the effect on operating leverage of increasing the fixed operating costs of the firm in Table 2 to ₦3,000. The changes in the firm's sales volume are the same as in Table 2, but the effect on the EBIT is considerably greater in table 3, Table 2,

Table 3: Operating Leverage and Increasing Fixed Operating Cost

	Case 2		Case 1
	-50%		+50%
Sales (in units)	500	1,000	1,500
Sales revenue	₦5,000	₦10,000	₦15,000
Less: Variables operating cost	2,500	5,000	7,500
Less: Fixed Operating Cost	3,000	3,000	3,000
Earnings before Interest And taxes (EBIT)	₦500	₦2,000	₦4,500
	-125%	+125%	+125%

Where the firm's cost were ₦2,500, changes of 100% in the EBIT resulted from 50 percent changes in sales. In Table 3 with fixed operating costs of ₦3,000, a 125 percent change in EBIT results from a 50 percent change in sales. This analysis supports the contention than an increase in the firm's fixed operating costs increase not only break-even volume but also the firm's operating leverage. The opposite is also true; a decrease in the firm's fixed operating cost will lower its break-even point and reduce its operating leverage. The key conclusion from the preceding discussion is that the higher the firm's fixed operating cost, the higher the degree of operating leverage and the higher the firm's break-even volume. The converse is also true.

CHANGES IN THE SALE PRICE PER UNIT:

An increase in the firm's unit sales price will lower the firm's break-even volume. An increase in the sales price per unit from N10 to N12.50 and a decrease from N10 to N7.50 would have the following effects on the break-even point of the firm in out earlier example. If we increase the sales price from N10 to N12.50 per unit, the break-even point calculated using equation 3 would become

$$\frac{N2,500}{(12.50 – N5.00)} = 333\ 1/3 \text{units}$$

If we decreased the sales price to N7.50 per unit the break-even point would become.

$$\frac{N2,500}{N(7.40 – N5.00)} = 1,000 \text{ units}$$

CHANGES IN THE VARIABLE OPERATING COST PER UNIT

An increase in the firm's variable operating cost per unit will raise the firm's break-even volume, while a decrease in the firm's variable operating cost per unit will lower the firm's break-even point.

The effects of an increase in the variable operating cost per unit from N5.00 to N7.50 and a decrease from N5.00 to N2.50 per unit on the break-even point of the firm in the preceding example are calculated below.

If we increase the variable operating costs to N7.50 per unit, the break-even point calculated using equation 3 would become:

$$\frac{\text{N2,500}}{\text{N(10.00 – 7.50)}} = \text{1,000 units}$$

If we decrease variables operating cost to N2,500 per unit, the break-even volume would become

$$\frac{\text{N2,500}}{\text{N(10.00 – 2.50)}} = \text{333 1/3units}$$

LIMITATIONS:

Although break-even analysis seems simple enough in concept and this simplicity is one of its virtues its effectiveness is limited in several ways. These limitations must be recognized and the method modified if it is provide meaningful results. The major criticisms of this type of analysis step from its assumption of linearity, its costs classifications, the difficulty of multi-product applications, and its short-term nature.

THE ASSUMPTION OF LINEARITY

One assumption of the method is that there is a constant price and variable cost per unit, irrespective of volume. In many cases, the firm's sales volume may influence the market price of a product. For example, increased output may lead to a decline in market price. Moreover, variable costs are likely to increase as the firm approach full capacity; for example, less efficient labour or costly overtime help may have to be used. These shortcomings of break-even analysis can be remedied by making the relationships between total sales and volume, and costs and volume non-linear, to correspond with economic reality.

COST CLASSIFICATION

Another difficulty with break-even analysis is the classification of cost as fixed or variable. In practice, many costs defy clear categorization because they are partly fixed variables. These costs are known as semi-variables costs. Moreover, we assume that costs classified as fixed remain unchanged over the entire, volume range, but this range is limited by the immediate physical capacity of the firm. For most situations, however, new physical capacity must be constructed if volume is to be increased beyond some critical point.

Consequently, a break-even analysis is relevant only for volume up to that point.

MULTI-PRODUCT APPLICATIONS

Another problem relates to multiple products break-even analysis perhaps is best suited for a one-product analysis, when there are multiple products, a single break-even analysis cannot be used unless the product mix remains unchanged. When the product mix does change, it may be necessary to prepare a separate break-even analysis for each product. Here allocating expenses that are common to all product lines may preset a problem.

UNCERTAINTY AND RISK

The information inputs for break-even analysis are usually based upon historical relationships. However, these relationships may not be particularly stable over time. For extreme volume changes, there may be no historical precedent. Moreover, it is not past relationships of costs, volume and profits that we are trying to judge but, rather future ones. These estimates are subject to uncertainty and risk elements that are not taken into account in traditional break-even analysis.

SHORT-TERM NATURE

Finally, we must note that the short-term horizon in break-even analysis is a limitation for longer-range planning. The benefits realized from certain expenditure, such as capital expenditures and research and development outlays likely to be realized during the period of time encompassed by most break-even analysis. A break-even analysis would not justify these expenditures, but they well be necessary to the continued life of the firm. Despite the many limitations of break-even analysis, however, it can be an important tool to the financial manager if it is employed properly and if it is reasonably appropriate to the situation.

FINANCIAL LEVERAGE

Financial leverage results from the presence of fixed financial charges in the firm's income stream. These fixed charges do not vary with the firm's earning before interest and taxes; they must be paid regardless of the amount of EBIT available to pay them. An examination of the lower portion of Table 1 indicates that the two financial charges normally found on the firm's income statement are; (1) Interest on debt and (2) preferred stock dividends. Financial leverage is concerned with the effect of changes in earning before interest and taxes on the earnings available for the common stock holders.

Favourable or positive leverage is said to occur when the firm earns more on the assets purchased with the funds than the fixed cost of their use. Unfavourable or negative leverage occurs when the firm does not earn as much as the fund cost. The favourability of financial leverages, or "trading on equity" as it is called, is judged in terms of the effect upon earning per share to common stockholders. We are interested in determining the relationship between eanrings per share and earning before interest and taxes (EBIT) under various financing alternative and the indifference points between these alternatives. Earnings per share are commonly considered instead of earnings available for common stock because the earnings per share, taxes, as well as the financial cost of interest and preferred stock dividends are deducted from the firm's income stream.

Example:

A firm expects earning before interest and taxes of ₦10,000 in the current year. It has a ₦40,000 bond with a 5 percent coupon and an issue of 500 share of ₦4 preferred stock outstanding; it also has ₦1,000 shares of common stock outstanding. The annual interest on the bond issue is ₦2,000

(0.05 x 40,000). Table 4 presents the level of earnings per share resulting from level of earnings before interest and taxes of ₦6,000, ₦10,000 and ₦14,000 for a firm in the 50 percent tax bracket.

Two situation are illustrated in the table

Table 4: The EPS for various EBIT levels

	Case 1		**Case 2**
	-40%		+40%
EBIT	N6,000	N10,000	N14,000
Less interest (I)	2,000	2,000	2,000
Earning before taxes (EBIT)	N4,000	N8,000	N12,000
Less tax (T)	2,000	4,000	6,000
Earning after taxes (EAT)	2,000	4,000	6,000
Less: Preferred stock dividend (p)	2,000	2,000	2,000
Earning available for common (EAC)	N0	N2,000	N4,000
Number of share	1,000	1,000	1,000
Earning per share (EPS)	N0	N2	N4
	-100%		+100%

EPS = EAC/Number of shares

Case 1: A 40 percent increase in EBIT (from N10,000 to N14,000) result in a 100 percent increase in earning per share (from N2 to N4).

The illustration above indicates that financial leverage works in both directions and that financial leverages exist when a firm has fixed financial charges. The effect of financial leverage is such that an increase in the firm's EBIT result in a greater than proportional increase in the firm's earning per share, while a decrease in the firm's EBIT result in more than proportional decrease in the firm's EPS

Whenever, a firm has fixed financial costs in its financial structure, financial leverage is present. An alternative way of defining financial leverage is given by equation 8.

$$\frac{\text{Percentage Changes in EPS}}{\text{Percentage change in EBIT}} > 1 \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

Wherever the percentage changes in EPS resulting from given percentage changes in EBIT is greater than the percentage change in EBIT, financial leverage exists. Applying equation 8 to case 1 and case 2 yield

$$\text{Case 1:} \frac{+100\%}{+40\%} = 2.5$$

$$\text{Case 2:} \frac{-100\%}{-40\%} = 2.5$$

In both cases, the quotient is greater than 1 and financial leverage exists. The higher this quotient is, the greater the degree of financial leverage a firm has. Because financial leverage, like operating leverage, works, in both directions, magnifying the effects of both increase and decreases in the firm's EBIT, higher levels of risks are again attached to higher degrees of financial leverage. High fixed financial costs thus increase the firm's financial leverage and its financial risk and the financial manager must keep this in mind in making financing decisions.

A GRAPHICAL PRESENTATION OF A FINANCIAL PLAN:

A financial plan that consisted of 5 percent bonds. 500 shares of N4 preferred stock, and 1,000 shares of common stock was used to illustrate financial leverage in Table 4. This financing plan can be illustrated graphically, like all plans of this type, it can be plotted as a straight line. This is because it is affected only by the deduction of certain fixed Naira costs. Plotting two values of EBIT, N10,00 and N14,000 and associated earnings per share of N2 and N4 give us the line in figure 2.

This line shows the earnings per share associated with each level of EBIT. It is interesting to note that the line intersects the EBIT axis at N6,000. This value of EBIT represents the level at which the firm's earning per share is equal to zero. The zero intersect can be verified by looking at case 2 in Table 4. At level of EBIT below N6,000, the firm would have negative EPS. This portion of the graph has not been included.

Break-even or Indifference Analysis:

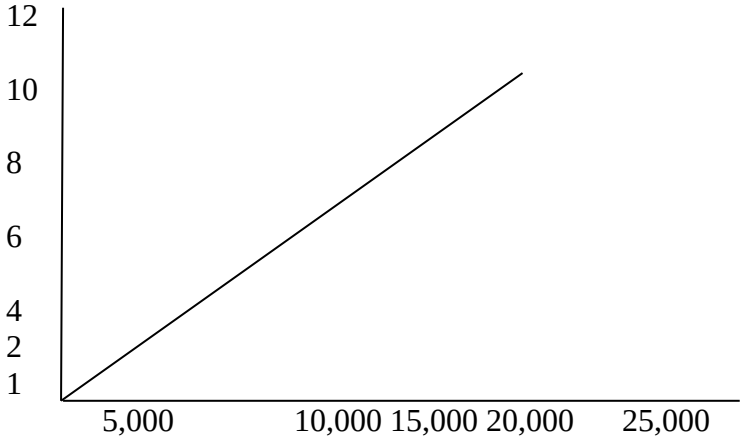
To illustrate a break-even analysis of leverage, suppose Sikah Company Plc with long term capitalization of ₦10 million, considering entirely of common stock, wishes to raise another ₦5 million for expansion through one of three possible financing plans. The company may finance with:

1. All common stock
2. All debt at 9% interest or
3. All preferred stock with a 7 percent dividend.

Present annual earnings before interest and taxes (EBIT) are ₦1,400,000, the income tax rate is 50 percent and 200,000 share of stock are now outstanding. Common stock can be sold at ₦50 per share under financing option 1, or 100,000 additional shares of stock.

Figure 2: A financing plan

EPS (N)



(EBIT)

In order to determine the EBIT break-even or indifference, points between the various financing alternatives, we begin by calculating earning per share for some hypothetical level of EBIT. Suppose we wish to know what earnings per share would be under the three financing plans if EBIT were ₦2 million. The calculations are shown in; table 5

Table 5: Calculations of Earning Per Share under Three Financing Alternatives

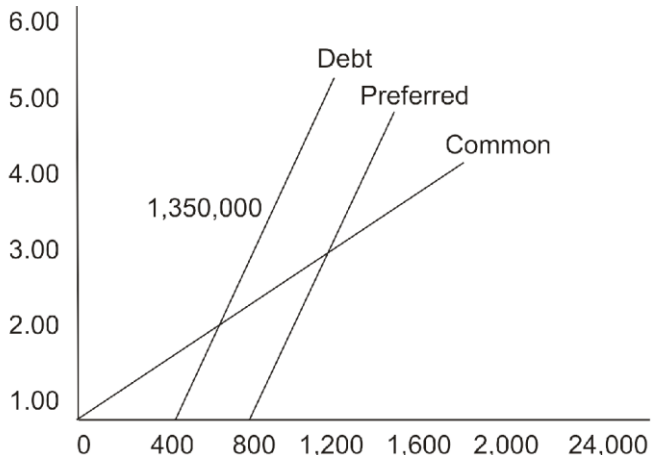
	All Common	All Debt	All preferred
Earning before interest			
And taxes (hypothetical)	2,000,000	2,000,000	2,000,000
Less interest	-	450,000	-
Earning before taxes	2,000,000	1,550,000	2,000,000
Less Taxes	1,000,000	775,000	1,000,000
Earn after tax	1,000,000	775,000	1,000,000
Less preferred stock dividend	-		350,000
Earning available to common			
Stock holder	1,000,000	775,000	650,000
Number of shares	300,000	200,000	200,000
Earning per share	3.33	3.88	3.25
Note: interest	=	.09 x 5,000,000	
Taxes	=	50% of EBIT	
Preferred stock dividend	=	.07 x ₦5,000,000	
EPS	=	EAC/Number of shares	

We note that interest on debt is deducted before taxes, while preferred stock dividends are deducted after taxes as a result earning available to common stock holders are higher under the All debt alternative than they are under the preferred stock alternative despite the fact that the interest rate on the debt is higher than the preferred stock dividend rate.

Given the information in table 5, we are able to construct a break-even or indifference chart similar to what we did for operating leverage. On the horizontal axis we plot EBIT and on the vertical axis, EPS. For each financial alternative, we must draw a straight line to reflect EPS for all possible levels of EBIT. To do so, we need two datum points for each alternative. The first is the EPS calculated for some hypothetical level EBIT. For ₦2million in EBIT, we see in table 5 that earnings per share are ₦3.33, ₦3.88 and 3.25 for the common debt and preferred stock financing alternatives. We simply plot these earnings per share at the ₦2million mark in EBIT. It is important to recognize that it does not matter which hypothetical level of EBIT we choose for calculating EPS.
Assuming good graph paper, one level is as good as the next.
The second datum point is simply the EBIT necessary to cover all fixed financial costs for a particular financing plan, and it is plotted on the horizontal axis. For the common stock alternative there are no fixed costs, so the intersect on the horizontal axis is zero. For the debt alternative we must have EBIT of N450,000 to cover interest charges (see table 5) so N450,000 becomes the horizontal axis intercept. For the preferred stock alternative. We must divide total annual dividends by one minus the tax rate in order to obtain the EBIT to cover these dividends. Thus, we need

N700,000 (350,000/1-0.50) in EBIT to cover N350,000 in preferred stock dividends, assuming a 50 percent tax rate. Again preferred dividends are deducted after taxes, so it takes more in before tax earnings to cover them than it does to cover interest. Given the horizontal axis intercepts and earnings per share for some hypothetical level of EBIT we draw a straight line through the two sets of points. The break-even or indifference chart for the Sikah Company shown in figure 3

Figure 3: Indifference chart for three financing alternative



We see the figure that the earnings per share indifference point between the debt and common stock financing alternatives is ₦1,350,000 in EBIT. If EBIT is below that point, the debt alternative is best. The indifference point between the common stock alternative will provide higher earning per share; above that point the debt alternative is best. The indifference point between the common stock and preferred stock alternative is 2,100,000 in EBIT. Above it, the preferred stock alternative is favoured with respect to earning per share; below it, the common stock alternative is best. We note that there is no indifference point between the debt and preferred stock alternatives. The debt alternative dominators for all levels of EBIT and by a constant amount of earnings per share namely ₦3.88 – 3.25 and by a constant amount of earning per share, namely ₦0.53.

The difference point between two methods of financing can be determined mathematically by

$$\frac{(EBIT - C1)(1 - t)}{S_1} = \frac{(EBIT - C2)(1 - t)}{S_2}$$

Where:

EBIT* = the EBIT indifference point between the two methods of financing for which we solve.

C_1, C_2 = Annual interest expenses or preferred stock dividends on a before tax basis for financing method 1 and 2 (fixed cost of financing for method 1 & 2) t = corporate tax rate

S_1, S_2 = number of share of common stock to be outstanding after financing for methods 1 and 2 suppose we wish to determined the indifference point between the common stock and the debt financing alternative in our example.

$$\frac{EBIT^* - 0)(0.5)}{300{,}000} = \frac{(EBIT^* - 45{,}000)(0.5)}{200{,}000}$$

Rearranging we obtain 0.5 (EBIT*) (200,000) = 0.5 (EBIT*)

(300,000) – 0.5 (450,000) (300,000)
100,000 EBIT* = 135,000,000,000
EBIT* = ₦1,350,000

The indifference point in EBIT, where earnings per share for the two method of financing are the same, is ₦1,350,000. This amount can be verified graphically in figure 3. Thus, indifference point for financial leverage can be determined either graphically or mathematically.

CALCULATION OF INDIFFERENCE POINT:
The break-even or indifference point between two alternative methods of financing can be determined by a formula. In the earlier example, suppose the firm is considering only two financial plans (Financial Plan I) and (Financial Plan II). The firm wants to know the level of EBIT at which EPS would be the same under both the plans. To find out the break-even level of EBIT, we may set the EPS formulae of two plans. The EPS formula under all-equity plan is:

$$EPS = \frac{(1 - T)(EBIT)}{N_1}$$

Where N_1 is number of ordinary shares under the first plan and since the firm has no debt, no interest charges exist. The EPS formula under the debt plan is:

$$EPS = \frac{(1 - T)(EBIT - 1NT)}{N_2}$$

Where 1NT is the interest charges on debt and N_2 is the number of ordinary shares under second plan. Setting the two formulae equal, we have:

$$\frac{(1 - T)(EBIT)}{N_1} = \frac{(1 - T)(EBIT - 1NT)}{N_2}$$

Using the values for Financial Plans I and II given in the example, we can determine EBIT as follows

$$\frac{(1 - 0.5)\ EBIT}{300,000} = \frac{(1 - 0.05)(EBIT - 450,000)}{200,000}$$

$$0.5\ EBIT \frac{200,000}{300,000} = 0.5\ EBIT - 225,000$$

$$0.333\ EBIT - 0.5\ EBIT = 225,000$$

$$EBIT = \frac{225,000}{0.167}$$

= ₦1,347,305.389: this is approximately
= 1,350,000

We can simplify these Equation as follows:

$$EBIT = \frac{N_1}{N_1 - N_2}(INT)$$

$$= \frac{300,000}{300,000 - 200,000} \times 450,000$$

$$= \frac{300,000}{100,000} \times 450,000$$

$$= 3 \times 450,000$$

= 1,350,000

Sometimes a firm may like to make a choice between two levels of debt. Then, the indifference point formula will be:

$$\frac{(1-T)(EBIT - 1NT_1)}{N_1} = \frac{(1-T)(EBIT - 1NT_2)}{N_2} \quad \ldots\ldots\ldots(10)$$

Where INT_1 and INT_2 represent the interest charges under the alternative financial plans. After simplifying the Equation (10) we obtain:

$$EBIT = \frac{N_1 \times INT_2 - N_2 \times INT_1}{N_1 - N_2} \quad \ldots\ldots\ldots\ldots\ldots\ldots(11)$$

Many other combinations of the methods of financing may be compared. The firm may compare between an all-equity plan and an equity – and – preference share plan. Then the indifference point formula will be:

$$\frac{(1-T)(EBIT)}{N_1} = \frac{(1-T)\,EBIT - PDIV}{N_2} \quad \ldots\ldots\ldots\ldots\ldots\ldots(12)$$

Equation (12) can be simplified as follows:

$$EBIT = \frac{N_1}{N_1 - N_2}\left[\frac{PDIV}{1-T}\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots(13)$$

The formula for the indifference points for the various combinations of the methods of finance are summarized below:

i. Ordinary share vs. ordinary share and debentures:

$$EBIT = \frac{N_1}{N_1 - N_2} \times INT$$

ii. Ordinary share vs. ordinary and preference share:

$$EBIT = \frac{N_1}{N_1 - N_2} \quad \frac{PDIV}{1-T}$$

iii. Ordinary share vs. ordinary and preference share and debentures:

$$EBIT = \frac{N_1}{N_1 - N_2} \times INT \left[+ \frac{PDIV}{(1-T)} \right]$$

iv. Ordinary shares and dentures vs. ordinary and preference share and debentures:

$$EBIT = \frac{N_1}{N_1 - N_2} \times INT \left[+ \frac{PDIV}{(1-T)} \right] - \frac{N_1 \times INT}{N_1 - N_2}$$

v. Ordinary share and preference shares vs. ordinary and preference shares and debentures:

$$EBIT = \frac{N_1}{N_1 - N_2} \times INT \left[+ \frac{PDIV_2}{(1-T)} \right] - \left[\frac{N_1}{N_1 - N_2} \times \frac{PDIV_1}{1-T} \right]$$

The Degree of Financial Leverage at a Particular level of EBIT

The degree of financial leverage at a particular level of EBIT is simply the percentage change in earning per share in relation to a percentage change in EBIT. To illustrate, suppose EBIT were N2 million in our example. A N1million increase would raise earnings per share from N3,88 to N6,38 by approximately 64.4 percent. When this percentage increase is taken over the percentage increase in EBIT 50 percent the degree of financial leverage is founded to be 1.29 an easier method for determining the degree of financial leverage is:

Degree of financial leverage at EBIT of y

$$= \frac{EBIT}{EBIT-C} \qquad \text{……..14}$$

Where as before C is the annual interest expenses or preferred stock dividend on a before-tax basis. From our example using the debt financing alternative at N2million in EBIT, we have

$$\text{DLF at N2million} \quad \frac{2{,}000{,}000}{2{,}000{,}000-450{,}000} = 1.29$$

For the preferred stock financing alternative, the degree of financing leverage is;

$$\text{DFL at N2million} = \frac{2{,}000{,}000}{2{,}000{,}000-700{,}000} = 1.54$$

Through an EBIT-EPS analysis, we can evaluate various financing plans or degree of financial leverage with respect to their effect upon earning per share.

However, certain limitations to the use of these tool of analysis should be pointed out at this time. The type of analysis presented implies that the firm should raise capital by the cheapest means possible usually debt as long as the expected return from investment of these funds exceeds their explicit cost. It is important, however, to recognize that this procedure usually is inappropriate if the objective of the firm is to maximize shareholder wealth. Implicit costs, represented by a decline in the price/earning ratio of the common stock because of increased financial risk, are ignored. A decline in the price/earnings ratio may partially or wholly offset the earnings per share advantage of using debt. Moreover, there is a tendency in such a static analysis to regard the explicit cost of debt and preferred stock as constant, regardless of the degree of leverage. However, we known that beyond a certain point, lenders require higher and higher rates of interest as leverage increase.

COMBINED EFFECT OF TWO TYPES OF LEVERAGE

When financial leverage is combined with operating leverage, the effect of a change in revenues on earnings per share is magnified.

The combination of the two increases the dispersion and risk of possible earnings per share. To determine the effect of a change in units of output on earnings per share, we combine the equation for the degree of operating leverage, Eq (7), with that for the degree of financial leverage, Eq (10). Because EBIT is simply X(P-V)-F, whereas before X is the units of output, P is price per unit, V is variable cost per unit, and F is fixed costs, Eq (10) can be expressed as

$$\frac{EBIT}{EBIT\ C} = \frac{X\ (P-V)\ F}{X\ (P-V)-F-C} \qquad \text{……(15)}$$

Combining this equation with that for the degree of operating leverage, Eq (7) we obtain:

$$\text{Degree of operating and Financial leverage at X units} = \frac{X(P-V)}{X(P-V)-F} \times \frac{X(P-V)-F}{X(P-V)-F-C}$$

$$= \frac{X(P-V)}{X(P-V)-F-C}$$

We see that the amount of fixed financial costs, C, increases the degree of combined leverage over what it would be with operating leverage alone.

Suppose that out hypothetical example firm used to illustrate operating leverage had N200,000 in debt at 8 percent interest. Assume that the selling price was N50 a unit, variable cost N25 a unit and annual fixed cost were N100,000. Assuming that the tax rate is 50 percent, the number of shares of common stock outstanding is 10,000 shares, and that we wish to determine the combined degree of leverage at 8,000 units of out-put.

Therefore:

DO & FL at 8,000 unit (or DCL at 8,000 unit)

$$= \frac{8{,}000\ (50 - 25)}{8{,}000\ (50–25\ \ 100{,}000–16{,}000)} = 2.38$$

Thus a 10 percent increase in the number of units produced and sold would result in a 23.8 percent increase in earnings per share (from N4.20 to N5.20). Earnings per share at the two levels of output are:

	8,000units	8,800units
Sales less total variables costs	N200,000	N220,000
Fixed cost	100,000	100,000
EBIT	100,000	20,000
Interest	16,000	16,000
Profit before taxes	84,000	104,000
Taxes	42,000	52,000
Profit after taxes	42,000	52,000
Shares outstanding	10,000	10,000
Earnings per share	N4.20	N5.20

This degree of combined leverage compares with 2.00 for operating leverage alone. We see, then the relative effect of adding financial leverage on top of operating leverage.

Operating and financial leverage can be combined in a number of difference ways to obtain a desirable degree of overall leverage and risk of the firm. High operating risk can be offset with low financial risk and vice versa. The proper overall level of risk involves a tradeoff between total risk (the product of operating and financial risk) and expected return. This tradeoff must be made in keeping with the objective of the firm.

SUMMARY

Operating leverage may be defined as the employment of an asset with a fixed cost in the hope that sufficient revenue will be generated to cover all fixed and variables costs. We can study the

operating leverage of a firm by using a break-even graph. This graph enables us to analyze the relationship between profits, various volumes, fixed cost, variable costs], and price. By varying these factors, management may determine the sensitivity of profits and in so doing obtain a better understanding of the operating risk of the firm. Whereas break-even analysis is a very useful tool, certain limitations to its effectiveness must be recognized.

Financial leverage is defined as the use of funds with a fixed cost in order to increase earnings per share. By using an indifference chart, we obtain earning before interest and taxes (EBIT) and earnings per share under various alternative methods of financing. The degree of sensitivity of earnings per share to EBIT is dependent upon the explicit cost of the method of financing, the number of share of common stock to be issued, and the analyzing the explicit cost of various methods of financing, it does not take into account any implicit costs inherent in the use of specific method of financing.

For both operating leverage and financial leverage, we can determine the degree of leverage. In the first case, we relate the change in profits that accompanies a change in output, in the second, the change in earning per share that accompanies a change in earning before interest and taxes. By combining the two formulas, we can determine the effect of a change in output upon earnings per share. In this way, we can better depict the relative influence of the two types of leverage.

Revision Questions

Mifo Company Limited, Manufacture and sells four types of products under the brand names A, B, C and D. the sales mix in value compromises 33 1/3 percent, 24 2/3 percent, 23 2/3 percent and 8 1/3 percent of product A, B, C, and D respectively.

The total budgeted sales are N60,000 per month. Operating costs are:

Variables cost	Percentage of sales
A	60 percent
B	68 percent
C	80 percent
D	40 percent

Fixed costs N14,700 each month

Calculate the break-even point for the product on an overall basis. It is proposed to change the sales mix as follows:

The total sales per month remaining N60,000:

A	25 percent
B	40 percent
C	30 percent
D	5 percent

Assuming that the proposal is implemented, calculate the firm's PV ratio, break-even point and profit

1. The break-even analysis is a useful device of profit planning. Do you agree? Discuss
2. How will P/V ratio, break-even point, and profit be affected by change in variable costs and volume?
3. Illustrate the impact of changes in fixed costs and selling price on cost volume profit relationships.