National Open University of Nigeria, Headquarters

91, Cadastral Zone, University Village Jabi, Abuja

FACULTY OF MANAGEMENT SCIENCES

Course Code: **BFN409**

Course Title: **Project Evaluation**

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COURSE GUIDE

INTRODUCTION

BFN 409: Project Evaluation is a semester course work of two credit units. It will be available to all students in the School of Business and Human Resources Management. The course consists of 4 modules involving the subject area of Project Evaluation.
The course guide tells you what the course is all about and the relevant materials that you require to make your study very successful. Other vital information contained in this course guide deals with Assessment which consists of the Tutor- Market Assignments, and written examination.

The Course Contents
The course contents consist of project evaluation from the project cycle to engineering evaluation, demand/market evaluation. It also includes financial and economic analyses of projects.

Course Aims
The aims of this course are to expose you to the knowledge of how to evaluate projects either as a project initiator or an evaluator. It aims to sharpen your skills in the evaluation of either new projects or existing projects with a view to deciding whether they meet certain predetermined investment criteria.

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

- discuss the totality of project evaluation
- prepare simple project plans/business plans
- evaluate projects submitted to you for consideration
- analyze the profit ratio and social profit of a project

The Course Materials
The main components of the course are:
1. The Course Guide
2. Study Units
3. References/Further Readings
4. Assignments

Study Units
There are 20 units in this course and they should be studied carefully

Module 1: Project Meaning
Unit 1 Project meaning, relation with programme
Unit 2The Project Cycle
Unit 3 Project Evaluations – An Introductory Format
Unit 4 Factors Affecting Location of Projects
Unit 5 Capacity and Production Planning
Unit 6: Techniques of Project Identification

Module 2: Project Planning and Analysis
Unit 1 Manpower Planning and Evaluation
Unit 2 Demand Analysis
Unit 3 Supply Analysis
Unit 4 Competition and Marketing Plans
Unit 5 Project Cost Analysis
Unit 6: Elements of project analysis

Module 3: Project Income and Evaluation
Unit 1 Projected Income Statement
Unit 2 Projected Cash Flow Statements
Unit 3 Projected Balance Sheets
Unit 4 Project Evaluation Criteria
Unit 5 Introduction to Economic Analyses
Unit 6: Cash flow Dimensions

Module 4 Risk and Cost Analysis
Unit 1 The Evaluation Methods
Unit 2 Concept of Risk in an Organisation
Unit 3 Risk and Uncertainty
Unit 4 Assessment of Social Profitability
Unit 5 Cost Benefit Analysis

Module 1 provides you with the necessary background knowledge you require for your study. The remaining module 2 to 4 focus attention on the subject matter of project evaluation. Each study unit will take at least two hours and it includes:
The introduction, objectives, main content, exercise, conclusion, summary,references and the Tutor-Marked Assignments (TMAs).
You are required to study the materials, reflect on them and do the exercises. Some of the exercises require that you visit some organisations and find out how they carry our project evaluation practice. You should also read the textbooks and other recommendedmaterials.

Assignments
In each unit, you will find exercises which you are required to do. Theexercises will enable you to have a better understanding of what youhave studied.

Assessment:
As a student of the Open and Distance Learning (ODL) system, you are expected to access your learning ability by the extent of your understanding of the units and the entire course. This assessment prepares you for the final examination. The final examinations will come at the end of the course. You are expected to write this examination whose score together with what you made in the TMAs will form the course grade.

Tutor-Marked Assignment
In doing the Tutor-Marked Assignments, you are expected to apply whatyou have learnt in the contents of the study unit. The TMAs areexpected to be computer base for grading. They constitute 30%of the total score.

Final Examination and Grading
At the end of the course, you will write the final examination. It willattract the remaining 70%. This makes the final score to be 100%.

Summary
The course BFN 409 – Project Evaluation will expose you to theknowledge and understanding of how to evaluate projects. When youcomplete the course, you would have been armed with the necessaryknowledge required to evaluate projects.

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MODULE 1 PROJECT MEANING

Unit 1 The Meaning of Project
Unit 2The Project Cycle
Unit 3 Project Evaluation – An Introductory Format
Unit 4 Factors Affecting the Location of Projects
Unit 5 Capacity and Production Planning
Unit 6The Concept Of Engineering Evaluation

MAIN COURSE

CONTENTS

1.0 INTRODUCTION

Ordinarily, a project is an undertaking that requires commitment of human and material resources.Projects require commitment and deployment of resources. As abusiness manager of the future, you will encounter various projects inyour work place or environment. Most of the projects are likely to beprivate sector driven. They may be manufacturing projects or theycould be petrochemical or civil engineering projects. Your key task, asa project evaluator, is to carefully consider each and every projectbrought to your attention and see how useful or valuable they are.

Our first task and which we will accomplish in this unit is to examinethe concept of a project cycle. This concept is very important as it givesus an overview of projects. The knowledge so gained, will lead usthroughout the duration of this course.

2.0 OBJECTIVES

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

• explain the meaning of project
• describe the various underlying characteristics of a project.

3.0 MAIN CONTENT

3.1.1 Definition of Project

Project has been defined in various ways. Some authorities see projects as mere activities while others see them as programmes of action.
Longman Dictionary of Contemporary English defines a project as "an important and carefully planned piece of work that is intended to build or produce something new, or to deal with a problem". From this simple definition, we can see that a project, apart from being
Important, should be carefully planned so as to produce something. Some of the things that a project seeks to produce may be tangible or intangible. A motorcycle is a tangible product but conducting a census is not a tangible product.
Also, A project is a temporary endeavor undertaken to create a unique product, service, or result. Like most organizational effort, the major goal of a project is to satisfy a customer's need. Beyond this fundamental similarity, the characteristics of a project help differentiate it from other endeavors of the organization.

3.1.2 **Characteristics of a Project**

The major characteristic of a project are as follows;

1. An established objective.
2. A defined life span with a beginning and an end.
3. Usually, the involvement of several departments and professionals.
4. Typically, doing something that has never been done before.
5. Specific time, cost, and performance requirements.

First, projects have a define objective – The following are examples of define objectives of projects

• Construction of a 50-bed hospital at Ikeja by the Lagos State Government. Or constructing a 12-story apartment complex by January 1 or releasing version 2.0 of a specific software package as quickly as possibly.
• Dualisation of the Benin-Lagos highway by the Federal Ministry of Works.
• Sinking of 10 water bore-holes at Ikorodu town by the local government council.
From whatever angle we see these projects, some of their features are that they will require the commitment and deployment of scare resources.

3.1.3 Differences between Project and Programme

What a project is not; project should not be confused with everyday work. A project is not routine, repetitive work! Ordinary daily work typically requires doing the same or similar work over and over, while a project is done only once; a new product or service exists when the project is completed.

Programme versus project; in practice the term project and programme cause confusion. They are often used synonymously. A programme is a group of related projects designed to accomplish a common goal over an extended period of time. Each project within a programme has a project manager. The major differences lie in scale and time span. Programme management is the process of managing a group of ongoing, inter- dependent, related projects in a coordinated way to achieve strategic objectives.For example, a pharmaceutical organization could have a programme for curing cancer, different project are outlined to achieve the set programme.

SELF ASSESSMENT EXERCISE
DiscussDifferences between Project and Programme .

4.0 Conclusion

This unit has treated the meaning of project, the characteristics, differences and it relation with programme. This is an introductory aspect to the study of project evaluation. Now that we have the basic foundation, we shall further our discussion with Project cycle as an introductory framework on project evaluation.

5.0 Summary

In this unit we have discussed the meaning of project.We have seen thecharacteristics of project, its relation to programme and their differences.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain what you understand by the Characteristics of a Project.
2. List and discuss the various objectives of a project.

UNIT 2 THE PROJECT CYCLE

CONTENTS

1.0 INTRODUCTION

Ordinarily, a project is an undertaking that requires concentrated effort. Projects require commitment and deployment of resources. As abusiness manager of the future, you will encounter various projects inyour work place or environment. Most of the projects are likely to beprivate sector driven. They may be manufacturing projects or theycould be petrochemical or civil engineering projects. Your key task, asa project evaluator, is to carefully consider each and every projectbrought to your attention and see how useful or valuable they are.

Our first task and which we will accomplish in this unit is to examinethe concept of a project cycle. This concept is very important as it givesus an overview of projects. The knowledge so gained, will lead usthroughout the duration of this course.

2.0 OBJECTIVES

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

• explain a project cycle

• describe the sequences in a project cycle.

3.0 MAIN CONTENT

3.1 The Project Cycle – Meaning and Stages

A project cycle tries to describe the various stages that are involved, from the conception of a project idea to when the project is executed oractually takes off. Understanding a project cycle is very important as itenables us to get the total picture of a project. We will now examine thevarious stages of a project cycle.

Basically, projects consist of the projection of ideas and activities into new endeavours. As earlier discussed, projects may be public sectorprojects in agriculture, defense or transportation. A major railway linkfrom Ibadan to Onitsha may constitute a major public sector project. Anew brewery springing up at Enugu is a typical example of a privatesector initiative. But whatever type of project that we are considering,we need to first understand what is usually known as the project cycle.

So before we go into the real subject of our discussion –Project Evaluation, we need to build a strong background. This background isin the form of proper understanding of how a project is conceived.Itexplains who conceives a project. It also explains the flow of activitiesup to the execution of the project.

The Project Cycle

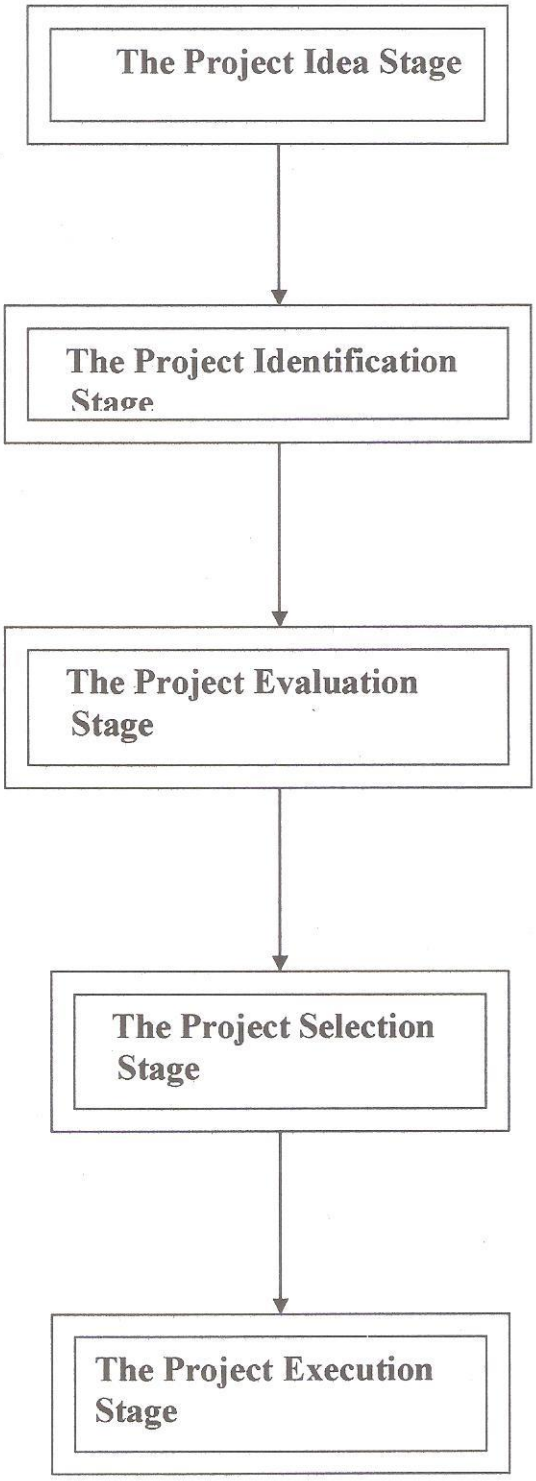

Figure 1 The project cycle

SELF ASSESSMENT EXERCISE 1
List the stages of a project cycle.

Customer
Marketing
Design
Production
Planning
Purchasing
Production
Figure 2 A manufacturing project cycle

3.1.1 The Project Idea Stage

The project idea stage is the first stage of a project cycle. The ideaabout a project arises from a variety of sources within the internalenvironment or market place.

New project ideas could originate from within an organisation or fromoutside the organisation. If the idea originates from within, it could befrom a sales person who has encountered some success or problem withcustomers while performing his or her functions.

You will also realise that a new project idea could emanate from outside an organisation. Coming from outside an organisation, it could berequests from existing customers asking for bigger or better products.

New project ideas may fall into any of the following categories.

• Proposal to add new products to existing lines: A company withexisting product lines may decide to add new products to itsexisting lines.

• Proposal to expand capacity in existing lines: A company mayhave a proposal to expand capacity to enable it take advantage ofenlarged market opportunities.

We need to stress that new project ideas may originate from any level in an organisation. A factory cleaner within an organisation may come upwith a new product idea. Also an executive director in an organization may also generate a new project idea.

3.1.2 The Project Identification Stage

After the project idea stage, the next stage is the project identificationstage. The project identification stage consolidates the idea stage.Project ideas are not really useful unless they are clearly identified andput down in a systematic manner for further processing.

The idea to introduce a new product into the market may come from acompany salesman who is very familiar with the market. At theboardroom room level, the entire organisation has to see the project ideaproperly and clearly identify it as a possible area of business investment.The totality of the new idea would be considered.

3.1.3 The Project Evaluation Stage

When a project has been identified, the next step is to evaluate the project. Project evaluation involves the estimation of the benefits andcosts of a project. Benefits and costs should be measured in terms ofcash flows.We have to emphasise at this point that the estimation of the cash flowof a project is a very difficult task. It is difficult in the sense that thecash flow to be estimated is future cash flow. For example in the year2007, we will tried to estimate the cash flow for the year 2008.

In a corporate setup, the evaluation of projects should be carried out by ateam of experts drawn from the various departments like production,marketing, accounts and administration. The team of experts should beobjective in their evaluation of projects.Alternatively, the evaluation of a project may be contracted to a thirdparty like consultants. Contracting evaluation of projects to tends to eliminate bias.

3.1.4 The Project Selection Stage

After the project evaluation stage, the next stage is the project selectionstage. Faced with an array of projects with different values and worth,there is need to select which projects to embarked upon. There is nostandard procedure for selecting projects as this will differ frombenefit seen. The important thing to note is that the project selection functionis a top management responsibility which in most cases goes toBoard of Directors of an organisation. In selecting projects,management usually considers the financial outlays involved andmatches them with the financial capabilities of the firm. For example, afirm that has only N10,000,000 (ten million naira only) be considering a new investment that involves a capital outlay of N40,000,000 (forty million naira only) except if it can sourcemoney externally e.g., from banks.

3.1.5 The Project Execution Stage

The project execution stage is the final stage in the project cycle. Aftera project has been selected, it moves on to the execution stage. In mostorganisations, the responsibility for execution of projects is vested on aproject management team raised by top management. The function ofthe team is to ensure that the budget for the project is spent entirely onthe project and that the project is completed on schedule.

In an ideal organisation, the project management team usually prepares amonthly budget consideration report on projects for top managementconsideration. This is important for project monitoring and control.

SELF ASSESSMENT EXERCISE 2

Discuss three sources of new project ideas.

4.0 CONCLUSION

This unit has treated the concept of the project cycle which is a steppingstone into our study of project evaluation. Now that we have built thenecessary background, we shall be discussing Project Analysis – anintroductory frame work in the next unit.

5.0 SUMMARY

In this unit we have discussed the concept of the project cycle. We haveseen that it starts from the project idea stage, goes to the identificationstage, to the evaluation stage. From the evaluation stage it moves to theselection stage and finally to the project execution stage.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain what you understand by the term “project cycle”.
2. List and discuss the various stages involved in a project cycle.

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe, (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 3 PROJECT EVALUATION – ANINTRODUCTORY FORMAT

CONTENTS

1.0 INTRODUCTION

In the first unit, we discussed the concept of the project cycle which isvery crucial to our understanding of project evaluation. In this unit, wewill discuss project evaluation in a proper context. In doing this, weshall build an introductory format which will assist us in our discussion. Evaluation of a project involves a careful consideration of the totality ofthe project with a view to seeing how useful or valuable itis Evaluation enables us to attach proper financial value to a project andalso allows us the liberty of comparing it with other projects.

You will note that an analysis is not done in a vacuum. It is usuallydocumented.A problem usually encountered in project evaluation is how to arrangethe work to make it readable or understandable.

A very simple format which we will adopt in the evaluation of projectsis one that recognizes the various functional aspects or units ofan organization.

2.0 OBJECTIVE

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

• explain the format for project evaluation.

3.0 MAIN CONTENT

3.1 Project Evaluation – An Introductory Format

The introductory format for the evaluation of projects is the arrangementof our work into carefully defined segments. We will now discuss thevarious segments of project evaluation.

3.1.1 The Technical and Engineering Segment

The technical and engineering segment of project evaluation tries toevaluate the total technical and engineering soundness of a project. Italso tries to relate the project to the environment in which it is located.

We will now proceed to draw up a checklist for the technicalengineering segment of project evaluation.

Table 1: A Checklist for the Technical and Engineering Segment

Item	Have you covered this in your evaluation?
Land for the project	
Civil works and foundations	
Steel structures	
Factory building	
Offices	
Wind force and direction	
Availability of electric power	
Availability of generator	
Potable water	
Water bore hole with fittings	
Sewage	
Existing roads	
Access difficulties	
List of machinery / equipment	
Availability of raw materials	
Availability of professionals (labour)	
Availability of skilled labour	
Availability of unskilled labour	

3.1.2 The Management Segment

After evaluating the technical and engineering segments of projects, thenext segment we need to discuss is the management segment.

The management segment focuses attention on the management aspects of aproject. Projects only become successful if they are well managed.We do not need to over-stress the importance of management. Again,we need to evaluate the legal form of the organization that is evaluated and see if it can carry the project in question.

Table 2: A Checklist for the Management Segment

Item	Have you covered this in your evaluation?
The legal form of the business Organisational structure Who will manage the project Qualifications of key staff Number of employees Salaries	

3.1.3 The Demand and Market Segment

The next segment we shall consider is the demand and market segment.This segment focuses attention on the demand for goods and servicesand relates it to the market. An evaluation of the demand for goods andservices is very important because demand translates to revenues. Also,we need to evaluate supply situations in the market. These two topicswill be treated in detail later.We will now examine a checklist for the demand and market segment.

Table 3: A Checklist for the Demand and Market Segment

Item	Have you covered this in your evaluation?
What is the population of the market? What is the nature of demand for the product? What are the factors affecting demand? What is the size of the market? What is the supply situation? What is the price of the demand? Market share Advertisement strategy Promotional strategy	

SELF ASSESSMENT EXERCISE

List and explain five items that you hope to find in the checklist of themanagement segment of a project evaluation.

3.1.4 The Financial Segment

The financial segment of project evaluation focuses attention on thefinancial aspects of projects.In discussing financial issues, we are considering all financial aspects ofa project such as start-up costs, financial plans, renames and costs andincome statements.

3.1.5 The Economic Segment

The last segment we will consider is the economic segment. Theeconomic segment considers projects from the macroeconomic point ofview. Economic analysis tries to measure the benefits and costs ofprojects in terms of their value to society as a whole.

Table 5: A Checklist for the Economic Segment

Item	Have you covered this in your evaluation?
Employment generating capacity Contribution to economic growth Contribution to government revenue Forward linkages of the project Backward linkages Externalities	

4.0 CONCLUSION

What we have achieved in this unit is to develop a format for conductingthe evaluation of projects.

5.0 SUMMARY

We have discussed the format of project evaluation. We did identify thefollowing as segments of project evaluation.

- The technical and engineering segment
- The management segment
- The demand and market segment
- The financial segment
- The economic segment

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the key segments of project evaluation

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 4 FACTORS AFFECTING THE LOCATION OFPROJECTS

CONTENTS

1.0 INTRODUCTION

In Unit 2 we discussed the format for the evaluation of projects. In thisunit, we shall discuss factors affecting the location of projects. This isimportant because it enables us as analysts to have a proper knowledgeof the key issues relating to project locations. Understanding this unitwill give you the advantage of knowing in advance what should be andwhat should not be when issues of project location are raised. Forexample if a project is located in an area without any justification, theproject analyst should be aware of this based on his or her previousknowledge of project location issues.

2.0 OBJECTIVE

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

• explain the factors affecting the location of projects.

3.0 MAIN CONTENT

3.1 Factors Affecting the Location of Projects

Whether in the private sector or the public sector, projects are locatedaccording to set guidelines. In the private sector, project location isbased purely on economic guidelines, usually put in place by the variousorganisations. These guidelines regulate the ways and means by whichprojects are located. In the public sector, projects may belocated according to a different set of guidelines and they may not be driven byProfit motive. It is the discussion of these factors affecting the locationof projects that will now take our time.

3.1.1 Nearness to Markets

A major factor affecting the location of projects is their nearness tomarkets. Most businesses are established primarily for profit.A business organisation will make profit if the goods or Produced are purchased by third parties. It is the difference betweenrevenues and costs that constitute profit. You will easily and quicklyrealise that most populations that constitute markets are located mainlyin the urban areas of Nigeria. So we shall hold firmly to the fact that thenearness to markets is a major factor influencing the location of mostprojects in Nigeria. Most of the entire population of Nigeria is locatedin such areas like Lagos, Onitsha, Port Harcourt, Kano, Ibadan, Abuja,etc. Because of this, most businesses and government establishmentsare located near the critical markets that they wish to serve. That is tosay those businesses follow their markets. Concentrations of people orcritical markets are very important to corporate officials who designmarketing plans.

If you take a good look at your environment, you will realise that a lot ofcompanies are located within Lagos. It is not by accident. Rather it isby design. Businesses are attracted to areas of core concentration ofpeople who constitute vital markets.

3.1.2 Nearness to Sources of Raw Materials

Nearness to sources of raw materials is another strong factor affectingthe location of projects, especially manufacturing concerns. Servicebased projects can locate without reference to any raw material source.But manufacturing concerns cannot afford to gloss over the issue of raw materials.For a manufacturing concern, the raw material source is very importantbecause in most cases, raw materials may constitute over 80% of aproduct. If a company decides to establish its factory very far awayfrom its raw material source, it is going to end up spending a lot ofmoney to transport raw materials from the source to its factory. Thiswill mean added costs and in the long run, the company may not be ableto compete effectively in its chosen market.

If you sit back and think deeply, you will see patterns of industriallocations that tend to suggest that most industrial projects are locatedclose to the sources of raw materials. The Nigerian Coal CorporationEnugu is located in Enugu close to the source of coal.

Most cocoa processing firms are located in the western parts of Nigeriabecause cocoa is found in abundant quantities there.In the eastern parts of the country, oil mills and vegetable oil plants litterthe economic landscape simply because the oil palm grows wildly thereand it is also the major raw material for palm oil manufacture andvegetable oil.

If you go up north, you will also realise that the tea producing companyis located at the Mambilla Plateau because the plateau is very rich in teacultivation.

3.1.3 Nearness to Power Supply

Power supply is a very critical input in business, whether service basedor manufacturing based. In the case of service-based concerns likebanks, electricity will be needed to power computers, servers and otherequipment needed to provide service to customers.In a manufacturing concern, electricity is everything. Withoutelectricity, a manufacturing concern is not likely to operate.

Electricityis needed to mix chemicals, to drive machinery and equipment and tostart electric motors etc.

So in the choice of where to locate, every concerned establishment orbusiness should properly address the issue of power supply.Interruptions in power supply create production problems for industries;this also translates to inability to meet production schedules, andinability to meet production schedules leads to frequent customercomplaints for failed deliveries. Frequent failures to deliver goods onschedule may lead to loss of customers.

In our peculiar Nigerian situation, irregular power supply has taken itstoll on the manufacturing sector and even service-based activities. Theresult of this poor public power supply has led most organisations tooperate their own plants but with the attendant high operating costs ofboth fuel and servicing of generating plants.

3.1.4 Nearness to Water Supply

Water is very important in business especially in manufacturingindustries. Many manufacturing companies use a lot of water for manufacturing activities.Soft drink manufacturers for example, use a lot of water in the production process.In the agricultural sector, garri processing factories use a lot of waterand they are attracted to areas where there is plentiful supply of water.

3.15 Availability of Good Road Networks

Availability of good road networks is another major factor influencingthe location of projects in the economic landscape. Road networks arevery important. They are important for the movement of essential rawmaterials from raw material sources to factories and also forthe movement of finished goods to the markets where they are needed.Most investors in the economy are usually attracted to areas with goodroad networks. Good road net works reduce the cost of transportation.

3.1.6 Availability of a Good Rail System

Another important factor influencing the location of projects is the availability of a good rail system. A good railway system ensures cheaptransportation and evacuation of raw materials from their sources tofactory locations and also the movement of finished goods to markets.You may observe that the development of trading locations in Nigeriaseemed to have followed the railway system. The North –Eraaislwtearyn system runs through towns today which have become tradingposts. Aba, Umuahia, etc., all enjoy good trading activities because theyare located along railway line routes.

3.1.7 Nearness to Airports

Another identified factor affecting location of projects is nearness toairports. A lot of businesses tend to be located close toAirports. encourage quick movement of people to and from variouslocations. If you take a good look at the country today, the towns thatare served with air links tend to be enjoying faster economic growth anddevelopment. Port Harcourt, Calabar, Enugu, etc., enjoy good air linkswhich facilitate the movement of people.

3.1.8 Availability of Land

In economic theory, there are four factors of production namely: land,labour, capital and the entrepreneur. Each of these factors is veryimportant. However, Land appears to assume very importantdimensions especially where large scale agricultural projects areinvolved. Very large agricultural projects like oil palm plantationsrequire vast areas of land before they can become profitable. A cassavafarm which will feed a garri processing plant needs to be very vast interms of land space. You may realise that invariably projects areattracted to areas where there is adequate land.

3.1.9 Political Considerations

The location of most business projects is driven mainly by economicmotives. Private sector projects are mainly profit-driven and theirlocation is based only on economic merits. Also the public sector, sincethe era of economic reforms, has bought the idea of economic reformsand is now locating projects based on economic merit and viability.

However, not all projects are located based on sound economicjudgment. Political considerations occasionally play very importantroles in deciding where a project will be located. For example an oilrefinery may be located very far away from crude oil sources. The costof transporting crude oil to the refinery may result in the refineryoperating at a loss.

3.1.10 Intervention Projects

Intervention projects are those projects which are conceived and locatedwithin specific areas to correct inequalities in distribution of resources.In the emerging political dispensation, the issue of uneven developmenthas been brought to the front line of discussions. Complicating thediscussions is the issue of resource control and the attendant politicaland social implications.

The Niger Delta region of Nigeria produces a major percentage of theoil revenues of Nigeria. Recent thinking is that the region hasNot received sufficient attention as a major oil producing region. Currently,the federal government is focusing attention on the region and a lot ofdevelopmental projects are now springing up in the area.

SELF ASSESSMENT EXERCISE

List and discuss four factors that have influenced the locationOf industrial projects in your present environment.

4.0 CONCLUSION

In this unit, we have discussed those factors which affect the location ofprojects in Nigeria. The projects may be private or public sector projects. The factors may be economic or in some cases be political.

5.0 SUMMARY

In this unit, we have discussed those factors that affect the location ofprojects in Nigeria. They range from market driven forces to politicalforces. We have also discussed intervention projects which are a newfeature in our economy.

6.0 TUTOR-MARKED ASSIGNMENT

a. Mention four factors that are likely to influence the location ofprojects in Nigeria.

b. Discuss the four factors that you have mentioned.

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 5 CAPACITY AND PRODUCTION PLANNING

CONTENTS

1.0 INTRODUCTION

In Unit 3, we discussed factors affecting location of projects. There weexamined such factors as nearness to critical markets, nearness tosources of power and other factors. In this unit, we shall discuss capacityand production planning.

2.0 OBJECTIVES

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

- explain capacity and production planning
- describe the practical applications in industry.

3.0 MAIN CONTENT

3.1 Capacity and Production Planning

Our interest in capacity and production planning is for two main reasons. First, it could be that we are project initiators trying to draw upa business plan for a start-up project in which case we want to knowwell in advance what the capacities of our plants will be andthe production plan. Understanding capacity of a project assists us to designand construct such items like cash flow statements, etc. On the otherhand, we could be analysts on the other side of the fence. In this case,we must have been presented with a business plan or a project plan andhave been asked to evaluate the project. So no matter on which side weare, we must understand capacity and production plans. No firmundertakes to produce goods without production plans. Production plansare linked to the firm's demand for goods and services. We shall nowdiscuss "capacity" in relation to production plans. The production plansare in relation to the manufacture of tangible goods.

3.2 Concepts of Capacity

Ordinarily, capacity means "ability to do something". But inproject terms, the capacity of a plant is a reference to the output of the plant ormachine. When discussing plant capacity, we should realise that thereare three types of capacity namely:

- Installed capacity
- Attainable capacity
- Actual capacity

Installed Capacity

The installed capacity of a plant or machine is the maximum output interms of tangible goods which the plant or machine is capableof producing at a given time. The capacity is usually given bythe manufacturers of the equipment.

We can therefore define installed capacity in terms of the following:

• Number of goods produced per minute
• Number of goods produced per hour
• Number of goods produced per day
• Number of goods produced per year

In practice, we usually define installed capacity in terms ofcapacity. The best way to visualise installed capacity is to consider aMercedes Benz car that has a speedometer limit of 200km per hour. Ineffect, 200km/hour is the maximum speed the car can attain according tothe manufacturers. This 200km per hour is the installed capacity of thecar.

SELF ASSESSMENT EXERCISE 1

A plant can produce 2000 sachets of water per hour, all things beingequal. What is the installed capacity of the plant per annum?

Attainable Capacity

We have just discussed the installed capacity of a plant or machine anddescribed it as the maximum output that a plant or machine can achieve.However in real life, no machine can work for 60 minutes in an hour, 24hours a day and 365 days in a year without breaking down. There mustbe production loss arising from servicing of the machines, changes inshift, repairs of machines, etc.Because of these reasons, we now have a more realistic capacity whichin the literature is known as the attainable capacity of a plant/machinery.

The attainable capacity captures the effect of plant servicing and orrepairs on production output.

Let us go back to our Mercedes Benz car. We said it has an installedcapacity of 200km per hour. Practically, we know that no person willlike to drive a car at a speed of 200km per hour. Everyone should bethinking of safety. We could agree amongst ourselves that 100km perhour constitutes a safe speed. In that line of thinking, we can now define100km per hour as the attainable capacity of the car. This is the speed atwhich a sane person can drive the car.

Actual Capacity

Actual capacity refers to the real output that a plant can achieve giventhe market situation. We should realise that the actual capacity of a plantdepends on a lot of factors. First is the issue of the market for the plant'soutput of goods. A plant should produce only what it can sell at a giventime.Again financial resources can limit the output of a plant because firmsrequire finance to purchase raw materials and other inputs forproduction.

3.3 The Nature of the Production Plan

The production plan shows exactly the proposed output of a plant orproject under consideration. In constructing the production plan,information on the plant capacity, shift arrangements, raw

materialsourcing, etc., are all used. Below is the production plan of a vegetableoil refining plant that uses palm kernel oil as base raw material.
You are requested to properly study the production plan and make sureyou understand it.

An Example of a Production Plan

The Plant

The plant under consideration is a modern vegetable oil refining plantusing palm kernel oil (PKO) as base raw material. The installed capacityof the plant is 50 metric tons per day of 24 hours.
Working on a shift of 10 hours, an output of 20.83 tons is possible whiletwo (2) shifts of 10 hours each will yield daily output of 41.66tons of refined vegetable oil. Because of the need to accommodate plantrepairs, servicing, public holidays, etc., the plant will be operated for300 working days in a year. Proposed capacity is based on 2 shifts of 10hours each per day.
To ensure that there is uninterrupted supply of palm kernel oil to feedthe plant, the project promoter already has in operation 26 Muar ban LeePalm Kernel Oil (PKO) expellers with a total Installed capacity of 220tons/day.

Table 6: Annual Capacity/Production Plan (Metric Tons)

	Year 1	**Year 2**	**Year 3**	**Year 4 - 5**
	2007	2008	2009	2010-2011
Installed Capacity	18,250	18,250	18,250	18,250
Attainable Capacity	16,425	16,424	16,425	16,425
Proposed Capacity	12,498	12,498	12,498	12,498

Propped capacity is based on the following:
Year 1 to 5: 2 shifts of 10 hours each per day and 300workday/year.
Attainable capacity is 90% of installed capacity.Installed capacity:
Installed capacity is 50 tons per day x 365 days.
This translates to 18,250 tons per annum

Production Activities

STAGE ONE Palm Kernel Crushing

Stage one of production involves the crushing of palm kernel to yieldpalm kernel oil (PKO). The residues are palm kernel cake (PKC) andpalm kernel sludge.

Palm kernel cake is sold to feed mills as a major ingredient for animal feed. Palm kernel sludge is sold to soap manufacturers.Refining Of Oil to Yield Edible Vegetable

Refining Of Oil to Yield Edible Vegetable

STAGE TWO

Stage two of production involves the refining of the crude Palm KernelOil (PKO) to yield edible vegetable oil.In refining of the oil, fatty acid is collected. The fatty acid is sold to soapmanufacturers.

Activity Flow

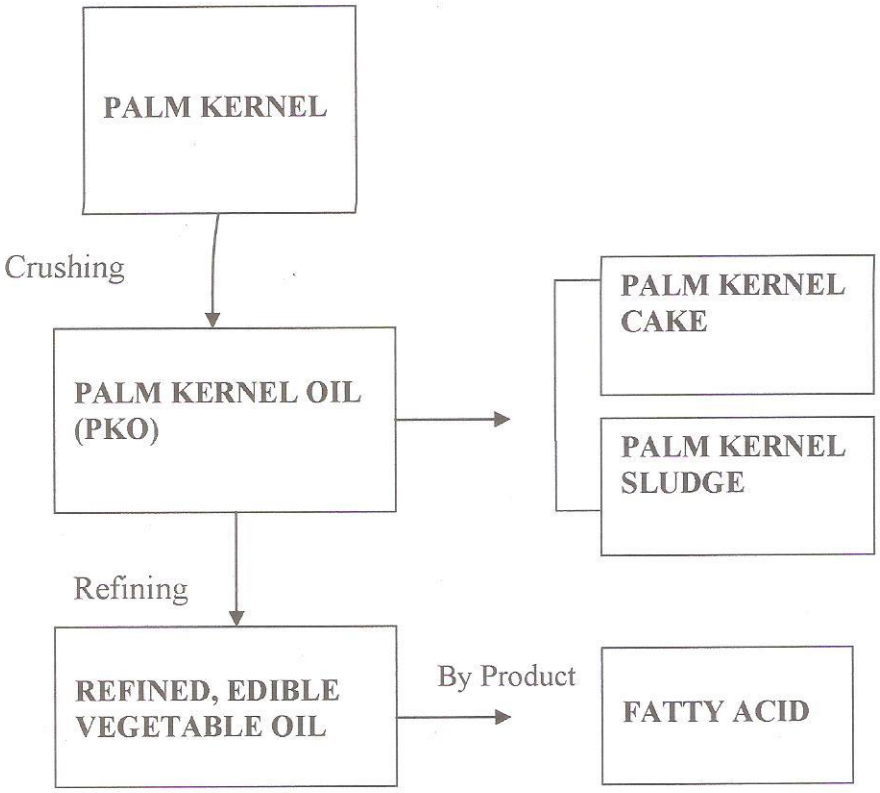

Figure 3: Activity flow in a vegetable oil refining plant

Machine and Equipment Required

The vegetable oil refining plant consists of the following equipmentbroken down into various sections:

1. Continuous oil pre-treatment section
2. Continuous bleaching section
3. Continuous physical refining and deodorising section
4. Thermal oil heating unit
5. Water cooling and recirculation system
6. Steam generation and distribution system

These machinery and equipment will be sourced from overseas.However, in addition, the following items form part of the equipment required but they will be sourced locally:

1. 2 units crude oil tank 200 tons
2 1 unit refined oil tank 300 tons
3. 1 unit fatty acid tank 50 tons
4. 1 unit furnace oil tank.

Vegetable Oil RefiningProcess Description

Pre Treatment

The crude oil received in the crude oil tanks, if required, is given a hotwater treatment and allowed to settle to remove settled impurities alongwith water. The oil is then heated till drying and transferred to highshear mixer wherein the requisite quantity of phosphoric acid is dosed into allow conversion of non hydra tablephosphotides. Theacidulatemixture is then given a retention time for complete reaction ofphosphoric acid in the reaction vessel.

Bleaching

The heated oil (acid conditioned, degummed or neutralised) enters theinlet mixing tube of the vacuum bleacher. Bleaching earth isproportioned by a valve dosing system that also desecrates thebefore it enters the vessel. The earth is introduced under the oil spray inthe mixing tube for improved mixing, so that earth does not enter thebleaching vacuum system. The earth absorbs any residual gumssoap as well as trace metals, colour bodies and other polar impurities.

The bleacher has multiple agitated compartments and operates undervacuum to ensure complete moisture and air removal. The dried oil andearth mixture is discharged by the bleacher discharge pump to one of thefilters where the spent earth is removed. The filtered oil is collected inthe bleached oil receiver. The bleached oil pump sends the oilfiter via one of the alternating polish filters.

Filter Management

The standard bleaching system is based on the use of two filters ofwhich one is on line while the other is being cleaned and prepared forthe next cycle. When a filter has reached maximum capacity, asindicated by high feed pressure, it is taken offline for cleaning andreplaced by the other filter.

The cleaning procedure begins by first pressurizing the filters with steamto expel residual oil into the Heel Tank and dry the spent filter cake. Theoil recovered from the filter cake is collected in the tank and can usuallybe recycled to the bleacher. After drying, a bottom discharge valve onthe filter is opened and the leaves pneumatically vibrated so that thespent cake is dislodged and discharged via a hopper. The filter is thenclosed and prepared for the next batch. Before going online again it canbe pre-coated with filter aid and/or bleaching earth in order to seal the filter.

Raw Material Requirements

The key raw material required for the refining of vegetable oil is palmkernel oil (PKO). The rest are additives.

Table 7: Raw Material Requirement

The key raw material required for the refining of vegetable oil is palm kernel oil (PKO). The rest are additives.

Table 7: Raw Material Requirement

Material	Sources	Unit Cost ₦
Palm kernel oil	Open markets in Onitsha, Owerri	N130,000/Ton
Citric acid	Pharmaceutical firms, open markets at Aba, Port-Harcourt, Owerri and Lagos.	N200/kg
Phosphoric acid	Freely purchased in chemical shops at Aba and other locations nationwide.	N300/kg
Bleaching earth	1) Vin George Ventures 7 Association Avenue, Lagos 2) Open markets at Aba, PH, Onitsha etc.	N88,000 per Ton

Annual Input-Output Analysis

The annual input–output analysis seeks to determine the inflowOfmanufacturing raw materials and their corresponding outflow ofproducts. It assumes 300 working days per annum. It aggregates thedaily input-output analysis.

Table 8: Annual Input – Output Analysis

Input	Output
32,889.60 tons of Palm Kernel	(1) 13,155.84 tons of Palm Kernel Oil (PKO) (2) 18,418 tons of Palm Kernel Cake (PKC) (3) 1,315 tons of Palm Kernel Sludge.
13,155.84 tons Palm Kernel Oil (PKO)	(1) 12,498 tons of Vegetable Oil (2) 657.84 tons of fatty acid

Table 9: Summary of the Proposed Production Plan (Tons)

Year Ended 31st Dec

		Year 1 2007	Year 2 2008	Year 3 2009	Year 4-5 2010-2011
1.	Refined vegetable oil	12,498	12,498	12,498	12,498
2.	Palm kernel cake (PKC)	18,418	18,418	18,418	18,418
3.	Palm kernel sludge	1,315	1,315	1,315	1,315
4.	Fatty acid	657.84	657.84	657.84	657.84

4.0 CONCLUSION

We have discussed capacity and production planning which are veryimportant aspects of a project because they both relate the project to themarket. Capacity and production plans enable the firm to plan well inadvance what to produce and in what quantity too.

5.0 SUMMARY

We have discussed capacity and production planning and haveestablished the link between them. We also used an exampleof vegetable oil refining plant to explain the production plan.

6.0 TUTOR-MARKED ASSIGNMENT

1. What do you understand by the installed capacity of a plant?
2. How is it different from the attainable capacity?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999): Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 6: TECHNIQUES OF PROJECT IDENTIFICATION

CONTENTS

1.0 INTRODUCTION

In this unit, we will examine project identification and project identification techniques. Project identification results from issues emerging from the external environment. You might pick up on these issues in the environment by reading reports on trends in the geographical area where you work and/or when speaking to stakeholders (including users) about the local issues arising. The unit also discusses a lot on project identification techniques that will address the needs and capacities of the stakeholders.

2.0 OBJECTIVES

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

understand the meaning and steps in project identification.

explain the top-bottom and bottom-up approaches to project identification as well as their merits and demerits.

Describe the various project identification techniques.

3.0 MAIN CONTENT

3.1 Project identification

Identification, the first stage of the projectcycle, is a crucially important process leadingto the initial screening of projects.Project identification is the initial phase of the project development cycle. It begins with the conceiving of ideas or intentions to set up a project. These ideas are then transformed into a project.

This first step in the project cycle is to identify an issue that a project could address. This usually involves ‘needs assessment andcapacity assessment’or ‘appreciative enquiry’ as referred by some people.*Need assessment*finds out what community needs are and whom they affect. The project should seek to strengthen any weaknesses. That is, prevailing problem in a given area. *Capacity assessment*is by asking community members to identify the resources they have and then asks them how they want to use them in the future. Also explain availability of resources in a given location.

Projects are usually identified or conceived by the followingentities:

a) Government agencies preparing the national,regional or sectoral developmentplan;
b) Bilateral or multilateral aid agencies/international development agencies conductingcountry economic/sector studies orex-post evaluation of completed projects;
c) Public or private-sector entities in the countryor donor countries, municipalities, policy makers; localresidents/group of people/communities, non-governmental organizations (NGOs), academics; and
d) Others (individuals or planners) conductinga project.

3.2 Steps in Project Identification

Project identification generally consists ofthe following steps:

1. Propose measures to solve major problemsidentified in the development strategy andto meet diverse development needs, whilesetting clear project objectives and identifyingtarget groups receiving benefits fromthe project;
2. Establish the project concept (together withalternative plans) that will effectively serveto achieve the country's development objectives;
3. Assess the priority or urgency of the projectin the context of the country's economicand social development plan and sector investmentprogram;
4. Examine consistency with the master plan and the regional development plan;
5. Consider the adequacy of the ExecutingAgency and the possibility of private-sectorparticipation in the project;
6. Estimate approximate project cost (togetherwith the cost of alternatives) based on theconceptual design; and
7. Make preliminary assessment of the feasibilityof the project and its impacts on thecountry, its specific region or sector.

3.3 Project Identification Techniques

There are two major techniques or approaches to project identification

a) Top-down technique/approach
b) Bottom-up technique/approach

A) Top-down technique/approach

In this approach, projects are identified based on demands from beyond the community. This may include directives from:international conventions; international institutions or NGOs that

have determined particular priorities and thus projects; national policy makers identifying projects that pertain to party manifestos and/or national plans. The approach as some advantages and disadvantages:

Advantages of Top-Down Approach

1. It may be a rapid response to disasters like floods, war outbreak because there is limited time and chance to consult the beneficiaries.
2. It can be effective in providing important services like education, health, water, roads etc.
3. It can contribute to wider national or international objectives and goals and therefore potentially be part of a wider benefit (e.gtrans-boundary resources, such as climate)

Limitations of Top-Down Approach

1. Does not help in modifying strongly established ideas and beliefs of people.
2. Assumes external individuals know better than the beneficiaries of the service.
3. Communities have little say in planning process rendering approach devoid of human resource development.
4. Community develops dependency syndrome on outside assistance and does not exploit their own potential.
5. The development workers (change agents) become stumbling blocks to people-led development tendency to impose their own biases, etc. on people.

Top-down techniques to project identification

Technique 1: The household (socio-economic) survey

This technique studies social and economic situations of a given area e.g. climate, geographical set-up, economic activities, political set up, education system, culture, diet, social services, physical infrastructure etc. The data collection techniques arelistening, questionnaires, interviews, documentation, and direct observation.The data collected through these means are processed and analyzed and projects are then identified.

Technique 2: Rapid appraisal

This is also called Rapid Rural Appraisal (RRA) when carried out in a rural areas, and Rapid Urban Appraisal(RUA) in an urban area. The method collects and assesses data quickly using any data collection techniques. The primary purpose is to acquire the information in the shortest time possible and it lowers the cost.It is rapid because investigation, assessment and identification of projects are done at the same time. Rapid appraisal uses the following data collection techniques:Analysis of secondary data sources; Interviews; Direct observation at site and visualization of Resources like social organizational maps and time series maps.

Technique 3:Needs Assessment Survey

It is also referred to as situation analysis (SITAN). It involves: fact finding about problems or needs in a given area or community; finding out what is lacking in a given area or community; investigating a situation in a given area; finding out the problem in a given community so as to identify the most appropriate solution (s)/project (s) to solve the problem (s) in question; and analyze the causes of the problems and seek likely solutions to the problems leading to project identification.

B). Bottom-Up Technique/Approach

In this approach community/beneficiaries are encouraged to identify and plan the projects themselves with or without outsiders. This approach also has some merits and demerits.

Advantages of Bottom-Up Approach

1. Interveners accomplish more with limited resources since people tend to safeguard what they have provided for themselves.
2. Develops people's capacity to identify problems and needs and to seek possible solutions to them.
3. Provides opportunities of educating people.
4. Helps people to work as a team and develop a "WE" attitude - makes project progressive and sustainable.
5. Resources are effectively managed; dependence reduces, there is increased equity, initiative, accountability, financial and economic discipline.

Limitations of Bottom-Up Approach

1. Not always effective for projects that require urgency to implement
2. Time-consuming and requires patience and tolerance.
3. People sometimes dislike approach because they do not want to take responsibility for action.
4. The agency using this approach is never in control and cannot guarantee the results it would want.
5. The priorities of communities may not fit with national or international priorities that seek to have a broader impact

Bottom-up techniques to project identification

Techniques 1: Animation

This is the process of stimulating people to become more aware and conscious of problems they suffer from. This will help to gain confidence in their ability to deal with these problems and take initiatives to improve situation. Animation makes the community better understand and be prepared to overcome its problems and take decisions with full responsibility. It is carried out by Animators / Helpers / Change agents, which could be internal or external (Internal Animators if they come from within the community or External Animators if from outside).

Technique 2:Facilitation/Community action

This technique is an attempt to assist people to get over problems by (say) training them in certain skills, providing them with the needed information e.g. market information, linking them up with relevant agencies and organizations to improve access to the needed resources etc.

Technique 3:Participatory Appraisal

The participatory appraisal technique could be in two forms - participatory rural appraisal(PRA) when carried out in rural areas; and participatory urban appraisal (PUA) when carried out in urban areas. PRA/ PUA techniques can be described as a family of approaches, methods and behaviours that enable people to express and analyze the realities of their lives and conditions, to plan for themselves what action to take, and to monitor and evaluate the results. The key to PRA/PUA is that the only external involvement is in facilitation. The communities themselves determine the issues, priorities and courses of action.Once the needs/issues have been grouped, community members can decide which of the issues should be given priority. They then place

them in order, from the most important to the least important. After priority has been set, decide whether it is realistic for the organization to strengthen the community's capacity to meet the priority need: Does meeting the need fit in with our mission?Does meeting the need agree with our values?Do we have enough experience? Do we have enough resources?

Technique 4:Needs Assessment Survey

It is also referred to as **situation analysis** (SITAN).In general, needs assessment is done fairly quickly. How projects come about through need assessment are: the project should come out of what people say they want and not from assumptions that we make; sometimes the needs are not immediately clear or cannot be easily understood; by talking to different people, we will be able to understand how problems affect people differently; circumstances change in the environments (such as there may be new people in the community; there may be new needs; old needs might have been addressed; and problems might be affecting people differently); and needs assessment gives people an opportunity to priorities their needs, which leads to a more sustainable development project.

Technique 5: Capacity Assessment Survey

Communities should be encouraged to use their own capacities and resources to address the problems they face. It is therefore important to carry out a capacity assessment after needs assessment to identify strengths that the community could use to address the problems they identified earlier. The project, if needed, should focus on strengthening the community's

capacities to address their problems. By doing this, we are facilitating the community to address their problems rather than addressing their problems for them.

Capacity Assessment involves Six Types of Assets, they are: *Human*: These enable people to make use of their other resources. They include skills, knowledge, ability to work and good health.

Natural: These form the local environment and include land, trees, water, air, climate and minerals.*Social:* These are based on relationships and include organizations and groups within the community, political structures and informal networks.*Economic:* These are things that people can use to sustain their livelihoods, such as money and savings, grain stores, livestock, tools and equipment.*Physical:* These are man-made, such as building, transport, water supply and sanitation services, energy sources and telecommunications.*Spiritual:* These include faith, scripture, guidance and prayer.

Technique 6: Focus Groups

This tool is used with a group of 10–20 people. It helps them to understand and voice some of the problems they face and the needs they have. A focus group enables people with different views to discuss their differences, challenge assumptions and come to a collective understanding of the needs of the community. By exploring issues together from the start, communities start to own the development intervention.

Questions to stimulate discussion could include the following:What are the main pressures that people in the community are facing?What simple things could be done to improve the situation?If you could change one thing in this community, what would it be? Why?

Technique 7: Community Mapping

This tool involves community members drawing a map of their community to tell their story together. They draw either on paper or outside on the ground, using whatever resources are available. They are given little guidance of what to include. The important point of the exercise is to discuss what people have drawn. The map might show the natural and physical resources in the area – forests, rivers, roads, houses, wells. It might show important people and organizations.

Once the map has been drawn, encourage discussion by asking questions such as:How did you decide what to include? What was excluded?What was emphasized? Which are the most important parts?What was difficult to represent? What were the areas of disagreement?What can we learn from the map about the needs of the community?To gain greater understanding of the issues facing different groups within the community, the groups should work separately. A map by young people may show very different information from that of older people.

These many techniques discussed enable communities to identify their needs and project identifier the project to do.

3.4 Tools for Data Collection among Project Identification Techniques

A few tools are outlined below as examples of some of the options available for data collection

Questionnaire:The kind of questions we ask makes a difference to the information we can gather. Asking the wrong kind of questions will limit the information discovered. The important thing is to avoid closed questions where people can answer only yes or no. Try to use open-ended questions which allow the person replying to give more information. For example, ‘What do you think of the new health post?’To explore people’s answers, questions normally begin with one of the six ‘helping words’: What? When? Where? Who? Why? How?

Listening:Listen carefully, and explore people's answers. Be flexible and be ready to ask unprepared questions if someone says something interesting. By listening for the issues about which people have the strongest feelings, it is possible to identify the issues that they most want addressed and projects which they are most likely to participate in.

Interviewing:This tool helps us to gain greater understanding of the issues. It involves talking to key people in the community in order to discuss their knowledge, experience and understanding of the issues. These people might already be involved in community development activities, they might be people that the community turn to in times of crisis or those who are seen as the heart of the community. Key people include health workers, traders, religious leaders, village chiefs, pastors and teachers. When choosing people to interview, make sure their views and opinions are likely to represent those of others in the community. Take care not only to interview the powerful, but also to interview those whose views are not usually heard.Use open-ended questions such as: What are the main problems you face in your area of work?What are the main pressures that people in the community face?What simple things could be done to improve the situation?

4.0 CONCLUSION

We conclude that need and capacity assessment are important for project identification. Helpful techniques for project identification are household (socio-economic) survey, need assessment survey, participatory appraisal, capacity assessment survey, focus group, community mapping and animation.

5.0 SUMMARY

In this section of the module, we have discussed project identification and steps in project identification. We them explain needs assessment and capacity assessment as mean of project identification. The section alsoidentify and talk about techniques for project identification household (socio-economic) survey, need assessment survey, participatory appraisal, capacity assessment survey, focus group, community mapping and animation.

6.0 TUTOR-MARKED ASSIGNMENTS

1. Discuss the meaning of project identification.
2. List the steps in project identification.
3. Identify and discuss five techniques of project identification in any of the approaches.

7.0 REFERENCES/FURTHER READINGS

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MODULE 2: Man Power Planning and Analysis

Unit 1 Manpower Planning and Evaluation
Unit 2 Demand Analysis
Unit 3 Supply Analysis
Unit 4 Competition and Marketing Plans
Unit 5 Project Cost Analysis

UNIT 1 MANPOWER PLANNING AND EVALUATION

CONTENTS

1.0 INTRODUCTION

In Unit 5, we discussed the concept of an engineering evaluation of aproject. Engineering evaluation of a project as we saw seeks to evaluatethe engineering soundness of a project. This is very crucial especiallywhen the project will be ranked or compared with another project.

Every enterprise requires labour. It is labour that coordinates the otherfactors of production like land and capital. In terms of projectevaluation, our concern is to look at the project and examine the humanresources aspects. In terms of manpower planning and evaluation, weneed to examine the following:

- Key employees
- The key responsibilities
- The qualifications
- Hours of work
- Training and development of the staff
- Remuneration of the staff

2.0 OBJECTIVES

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

- explain manpower planning and evaluation
- discuss the practical applications in industry.

3.0 MAIN CONTENT

3.1 Manpower Planning and Evaluation

In general terms organising manpower in an organisation is the processof assigning duties amongst personnel and coordinating efforts towardsthe attainment of the firm’s objectives. But

before organising, there mustbe a plan. It is the plan that leads to the shaping of an organization'sstructure.
Conceptually, the project initiative in structuring the organisation shouldbe concerned about two critical things.
• Job definitions in the project under consideration
• Departmentalisation which follows job definitions.In doing this, similar jobs are grouped together to form a department.The most common way of organising a project is by function.
For example a manufacturing plant may be divided into threetype'snamely:

• Production
• Marketing
• Finance

There are two uses of the manpower plan. The first use is by the projectinitiator. When the project initiator is structuring the project, themanpower plan definitely is a critical component. The project initiatorneeds to know well in advance who the key employees will be. The keyemployees will depend on the nature of the business in question. If thebusiness is, for example, soap manufacturing, then a lot of theproduction staff should be industrial or pure scientists plus other coresupport staff. Apart from that, each employee should have their variousresponsibilities. For example, in a soap plant, you will have production staff and also quality control staff. They have difference responsibility. And of course, the qualifications of the various staffincluding their years of experience should be properly documented andevaluated.
The second use of the manpower plan is that financial institutions likebanks, before granting loans or overdraft for a project, usually insist onbeing convinced of the management skills that will be available or areactually available in the firm that seeks to borrow money. They willlook at the people concerned, their qualifications and match them withthe jobs allocated to them.
Hours of work and the salary and wages of the entire work force areanother critical input. The salary and wages of those working on aproject is actually expected to hover around the average for the industry.
In practical terms, the manpower of a project can be grouped into twonamely:
• Direct labour
• Indirect labour
When we talk about direct labour in a manufacturing project, e.g., a soapplant, we are talking about staff attached to the actual production of thesoap. The production manager, production supervisor and factoryattendants are all direct labour.
Indirect labours on the other hand are those workers who do not workdirectly on the manufactured goods but indirectly. They includeaccounting and admin staff, marketing staff and others.We have an example of a manpower plan. It contains the following:
• Manpower requirements of the project broken down into direct andindirect labour
• Remuneration of the staff

SELF ASSESSMENT EXERCISE

List and explain four departments that could be found in a bigmanufacturing firm.

Table 13: Manpower Requirements of the Project

(a) ___Indirect Labour

Post	Specifications	Job Functions
General manager	Degree in sciences, engineering or management but with previous experience in a water packaging outfit	To oversee the general management of the factory
Accounts/admin. officer	OND Accounting with at least 2 years post qualification experience	General administration and keeping of the books of account. Reports to the General Manager
Marketing officer	B.Sc or HND Marketing with previous experience in marketing of packaged water	Reports to the general manager and is in charge of marketing of the company products
Sales clerk	Senior Secondary School Certificate or GCE	Reporting to the marketing officer, the sales clerk will be responsible for all clerical duties concerning sales
Accounts clerk	Senior Secondary School Certificate or GCE	Reporting to Accounts/admin officer, the accounts clerk will be responsible for clerical accounting duties including receipt of cash.
Secretary	OND secretarial studies with at least 2 years experience in a busy organisation	Reporting to the general manager, the secretary will be in charge of all secretarial duties
Drivers	FSLC but with good knowledge of the environment	Carriage and general distribution of the company products
Security staff	FSLC	General security duties

Post Specifications Job Functions

General manager Degree in sciences, To oversee the generalengineering or management of the factorybut with previous experiencein a water packaging outfitAccounts/admin. OND Accounting with at General administration andofficer least 2 years post keeping of the books ofqualification experience account. Reports to theGeneral ManagerMarketing officer B.Sc or HND Marketing Reports to the generalwith previous experience in manager and is in charge ofmarketing of packaged water marketing of the companyProductsSales clerk Senior Secondary School Reporting to the marketingCertificate or GCE officer, the sales clerk willbe responsible for allclerical duties concerningsalesAccounts clerk Senior Secondary School Reporting toCertificate or GCE Accounts/admin officer, theaccounts clerk will beresponsible for clericalaccounting duties includingreceipt of cash.Secretary OND secretarial studies with Reporting to the generalat least 2 years experience in manager, the secretary willa busy organisation be in charge of allsecretarial dutiesDrivers FSLC but with good Carriage and generalknowledge of the distribution of the companyenvironment productsSecurity staff FSLC General security duties

(b) Direct Labour

(b) **Direct Labour**

Post	Specifications	Job Functions
Production manager	HND water technology with at least 2 years experience post NYSC	To oversee the production function in the water plant
Shift supervisors	OND in science with relevant experience	To supervise production shifts
Technicians	City & Guild/Trade Test	Maintenance of the mechanical and electrical components of the plant
Laboratory technician	OND Laboratory Science	Reporting to the production manager, the laboratory technician will be in charge of quality control
Factory attendants/machine operators	Senior Secondary School Certificate or GCE	General factory duties including operation of the water filing machine, pre-market packaging of the sachet water and loading.

Post Specifications Job Functions

Production manager HND water technology To oversee thewith at least 2 years production function inexperience post NYSC the water plantShift supervisors OND in science with To superviserelevant experience production shiftsTechnicians City & Guild/Trade Maintenance of theTest mechanical andelectrical componentsof the plantLaboratory technician OND Laboratory Reporting to theScience production manager,the laboratorytechnician will be incharge of qualitycontrolFactory Senior Secondary General factory dutiesattendants/machine School Certificate or including operation ofoperators GCE the water filingmachine, pre-marketpackaging of the sachetwater and loading.

(c) Summary of Manpower Requirements Including Outlays

(c) Summary of Manpower Requirements Including Outlays

	No Required	Annual Outlays (₦)
Indirect Labour		
General manager	1	420,000
Accounts/admin officer	1	240,000
Marketing officer	1	240,000
Sales clerk	3	360,000
Accounts clerk	2	240,000
Secretary	1	180,000
Driver	3	288,000
Security staff	4	336,000
Sub-Total	**16**	**2,304,000**
Direct Labour		
Production manager	1	360,000
Technicians	2	288,000
Shift Supervisors	4	720,000
Laboratory technician	1	180,000
Factory attendants/machine Operators	12	1,296,000

Sub-Total	**20**	**2,844,000**
Grand Total	**36**	**5,148,000**
Staff Welfare		**514,800**
Total Salary, Wages/Welfare		**5,662,800**

No Required Annual Outlays (N)
Indirect Labour No.
General manager1 420,000
Accounts/admin officer 1 240,000
Marketing officer 1 240,000
Sales clerk 3 360,000
Accounts clerk2 240,000
Secretary 1 180,000
Driver 3 288,000
Security staff 4 336,000
Sub-Total16 2,304,000
Direct Labour

Production manager 1 360,000
Technicians 2 288,000
Shift Supervisors 4 720,000
Laboratory technician 1 180,000
Factory attendants/machine 12 1,296,000
Operators

Sub-Total20 2,844,000
Grand Total 36 5,148,000
Staff Welfare 514,800
Total Salary, 5,662,800
Wages/Welfare

4.0 CONCLUSION

This unit has treated manpower planning and evaluation which isacritical aspect of evaluation of projects. The unit has focused attentionon the manpower aspects of a project

5.0 SUMMARY

In this unit, we have discussed manpower planning and evaluation. Wehave seen how manpower planning involves the assigning of duties topersonnel and have also tried to relate manpower to a firm's objectives.

We also saw that departmentalisation is a critical aspect of a manpower plan. Also we discussed the use of the manpower plan. Wesaw that the manpower plan can be used by two different groupsof people – the project initiator and the evaluator.

6.0 TUTOR-MARKED ASSIGNMENT

Why is a manpower plan important in a start-up project?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 2 DEMAND ANALYSIS

CONTENTS

6.0 Tutor-Marked Assignment
7.0 References/Further Readings

1.0 INTRODUCTION

In Unit 1, we discussed manpower planning and evaluation. Here wesaw the fact that labour is one of the most important aspects of a projectwhether a start-up or an on-going one. We also used an example to drivehome our point.

In this unit, we shall discuss demand analysis. Demand analysis is onefirst steps towards looking at a market.Demand analysis is the starting point of our discussions concerning theproject and the external environment which is the market. A project isestablished for a purpose –to serve a market.

The demand analysis is the measurement and forecasting of demand forgoods and services of a project. It is like a peep into the future, which asyou know, is unknown. A project will survive if the products andservices produced by the project are acceptable to the market.

Acceptability means that consumers are willing to pay for the goods orservices. Demand analysis is a tool used by the project initiator toanalyse the total picture of the market that he/she wants to play in.Likewise, providers of loanable funds like banks also conduct demandanalysis to ensure that the projects they wish to sponsor financially havethe chances to survive in the market. So from whatever angle you lookat it, demand analysis is important.

2.0 OBJECTIVES

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

- explain what a demand analysis is
- discuss how to conduct demand analysis.

3.0 MAIN CONTENT

3.1 The Demand Analysis – Analytical Framework

To arrange our discussion in an orderly manner, we will try to build ananalytical framework that we shall use to do demand analysis.The frame work will guide us to take an architectural view of the subjectmatter. In taking an architectural view, we shall be looking at the largerpicture. The analytical framework we shall adopt will follow thesequence below:

- Get total population data and make projections.
- Study the details of the population.
- Define the good or service for which demand analysis isto beinducted.
- Define demand again to guide your direction.
- Look at factors affecting demand.
- Using both quantitative and qualitative techniques, generateconditional demand.
- Generate projections for demand using quantitative and qualitativemethods.

Table 14: Census 2006: Nigerian Population Data

Abia	2,833,999
Adamawa	3,168,101
Akwa Ibom	3,920,208
Anambra	4,182,032
Bauchi	4,676,465
Bayelsa	1,703,358
Benue	4,219,244
Borno	4,151,193
Cross River	2,888,966
Delta	4,098,391
Ebonyi	2,173,501
Edo	3,218,332
Ekiti	2,384,212
Enugu	3,257,298
FCT	1,405,201
Gombe	2,353,879
Imo	3,934,899
Jigawa	4,348,649
Kadunna	6,066,562
Kano	9,383,682
Kastina	5,792,578
Kebbi	3,238,628
Kogi	3,278,487
Kwara	2,371,089
Lagos	9,013,534
Nasarawa	1,863,275
Niger	3,950,249
Ogun	3,728,098
Ondo	3,441,024
Osun	3,423,535
Oyo	5,591,589
Plateau	3,178,712
Rivers	5,185,400
Sokoto	3,696,999
Taraba	2,300,736
Yobe	2,321,591
Zamfara	3,259,846
Total	**140,003,542**

3.2 Analysis of a Population Data

We have seen that the starting point of our discussion of a properdemand analysis is to study the population. But we should alsounderstand that getting the total population figure is not the end of thejob. We should go further and analyse the population. The purpose ofthe analysis is to understand certain characteristics of the population.

For example, a manufacturer of lipstick has nothing to do with the totalpopulation. Rather what is important to the manufacturer is the totalfemale population. There are other aspects of the population that weconsider important. Age distribution of a population is one of suchaspects. The age distribution of a population is important because itbreaks down the population into the various age brackets. Perfectknowledge of the age distribution of a population enables a would-beinvestor have an idea of his total feasible market well in advance. Forexample, a manufacturer of baby toys will not be interested in the totalpopulation of Nigeria. What will interest the manufacturer is the totalnumber of babies in the population. We have stressed the importance ofpopulation data in the understanding of demand analysis. We will go a

step further to provide a checklist of further information that is requiredwhen we are analysing a population data.

Table 15: Analysis of a Population Data-A Checklist

Item	Have you built this into your demand analysis?
Population of Nigeria by state	
Population by local government area	
Population of Nigeria by sex	
Population distribution by types of household	
Population distribution by age	
Population distribution by literacy level	
Population distribution by level of economic activity	
Population distribution by material status	
Population distribution by type of disability	
Persons arriving Nigeria by nationality	
Persons arriving Nigeria by age group	
Persons departing Nigeria by nationality	
Persons departing Nigeria by age group	

3.3 Potential Customers

A starting point for our discussion is to properly define whothe potential customers of the business are or will be. Customer definition isnot an easy task as we shall soon see.Sometimes confusion arises as to who is a customer because people alsofail to distinguish customers from consumers.

The term consumer refers to the person or one who uses a product (orservice) for his/her personal satisfaction or benefit. The consumer is the one who changes the form of a product toalter its identity. For example, a soap manufacturer will buy caustic sodaand use it to manufacture soap. He is the consumer of the raw material.On the other hand, a customer may be a consumer or a dealer who buysa product and eventually resells the product. Also even for a service, thebusiness should clearly identify the types of consumers that they wish toserve. For example, there may be many types of hotels because of thetypes of customers that need to be served namely:

- hotels for students
- hotels for travellers
- hotels for high-class individuals

Table 16: A Potential Customer Checklist

Item	Has this been taken care of in the plan?
What type of business are you planning? What products or services will you offer to the market? Who is your potential customer? How do you define your potential customer? What are your customer characteristics? What are their income levels? Who are the consumers of your product or service? Are the consumers different from the customers? Where are your customers located?	

3.4 Evaluating the Size of the Market

Apart from identifying who the potential customers of the smallbusiness are, there is the need for us to go ahead and evaluate the size ofthe market for our products or services. The evaluation of the size of themarket is very important because it gives us a picture of the total marketsize in terms of naira and kobo.

A standard analysis should state the market size of the product or servicein question. The size of the market is usually estimated by using bothqualitative and quantitative methods. To enable us

approach our studiescarefully, let us follow the following steps in our effort to evaluatemarket size:

- Define demand
- Examine factors affecting demand
- Examine demand for intermediate and capital goods
- Build market demand.

Defining Demand

For us to be able to properly prepare demand analysis, we need to definedemand and understand what we mean by demand.For purposes of our study, we shall define demand for a product orservice as the total quantity of goods or services that able customers in adefined area are willing to buy at set prices. In effect therefore, demandrefers to a set of quantities that customers are willing to buy at different in prices. In the traditional economic setting, the demand curve isdownward sloping (with a price and quantity axis).It will also be very important for us at this particular time to define anddistinguish between two types of demand – total market demand andproject demand. Total market demand refers to the total demand withina set geographical area like Nigeria. For example we can make statement that the total demand for beer in Nigeria is 10 million bottlesper annum. The meaning of the statement is that in Nigeria, the totalquantity of beer demanded is 10 million bottles at the current rulingprices. But we also need to define another type of demand which weshall call project demand.

Project demand is a subset of the total market demand. If a market for aproduct or service already exists, the project demand is theprojects total market demand. If a market is saturated with goods, newprojects may face the difficulty of selling their products or services. Byand large, it is important to focus attention on a projects which tend to be fatal occur when analysts confuse market andproject demand.

Factors Affecting Demand

We have just defined demand which is very important in our study. Butwe need to go a step further to examine the factors affecting demand inthe market place. It is going to help us build a good demand schedule. Inthe traditional economic platform, one of the most important factorsaffecting demand is price. If we assume a well behaved demand curve,then the higher the price of a product, the smaller the quantity that willbe bought.Also the lower the price, the greater the quantity that will bepurchased. This appears to be a rational behaviour especiallywhen human beings are involved.

Another important factor affecting demand for a product or service is theincome of the population. Given a basket of income available to purchasers, it is logical to believe that the higher incomes of people, the more goods and services they are likely to purchase. So wecan say with a measure of confidence that a population with a higherincome is more likely to purchase more goods and services population with a lower income.

Apart from income, population is another major factor affecting demandin any given setting. It is certain that a large population demand more goods and services than a smaller population. A majoraspect of any population which we should not forget is the ethnic andreligious structure of the population. The ethnic structure of a populationaffects the type of goods and services that will be demanded. Forexample, in the Nigerian setting, palm oil tends to sell much more in theSouthern States than in the North because most Southerners tend to usepalm oil in cooking. But in the Northern States, groundnut oil seems tobe more available and by implication the people use more of it for theircooking. Also, religion is another aspect of any population that needs tobe looked at while drawing up any demand schedule. Again in theNigerian setting, pork is not an acceptable diet for Muslims but mostChristians eat pork. These are the type of critical inputs you need whenyou are trying to build a demand schedule. Prices of other goods alsotend to affect demand. For example, tea and sugar are said to complementary goods since they go hand in hand. It is therefore logicalto say that the price of tea at any given time will affect the demand forsugar. In the same fashion, bread and butter also appear to becomplementary goods.

Demand for Intermediate and Capital Goods

When we largely discussed demand our general thinking appeared to bethat the goods discussed ought to be consumer goods. But that is notalways true. There are some goods which are generally known asintermediate and also capital goods. It is important that we understandthese two types of goods.

We shall go ahead to discuss intermediate goods as goods which are notpurchased for immediate consumption but rather are used in theproduction of consumer goods. For example flour is an intermediategood mostly used in the manufacture of bread. Tyres also appear to beintermediate goods if purchased by a car manufacturers. But a tyre isalso a consumer product if purchased by Mr. Solomon for use in his car.On the other hand, capital goods are those goods that are used for themanufacture of both intermediate and consumer goods. A manufacturingplant is a capital good. One thing we need to know about capital goodsis that they last for very long periods because of their nature.

Building a Market Demand

We have defined what demand for a product or service is generally.

Also we understand what a population is.

Let X = No. of persons in a population

Y = average number of a given product consumed byeach person in that population per annum

Then XY = Total market demand per annum for the product inquestion

SELF ASSESSMENT EXERCISE

There are 400,000 persons in a city called Ireoluwa. Each person in thecity drinks a bottle of water daily. What is the annual demand for waterin Ireoluwa.

3.5 Forecasting Future Demand

Some of us will assume that building the demand schedule for a productis all that is required; but that is not true because the analyst should beable to forecast future demand for the product in question or the serviceas the case may be. Forecasting future demand appears to be a difficult task because there is a lot of uncertainty attached to the forecastof a future event. Ordinarily, the demand for many goods may be eitherstable, erratic or out rightly unpredictable. Social change, structuraladjustments, change of taste and technology all add up to forecasting a difficult task especially of demand.

Usually, there are two basic approaches that are available when trying toforecast demand namely:

- Qualitative techniques
- Quantitative techniques

Qualitative Techniques

Qualitative techniques are mainly desk methods which are based onreports obtained from various sources. One of the sources could expert opinion obtained from a pool of experts in an industry experts usually are seen to be knowledgeable about a product or industryand therefore are in a position to forecast what the future demand for a

product is likely to be. Another way of obtaining information for use inforecasting demand is known as the sales force composite method.

With this method, salesmen in a particular industry can provide expertdata on demand. But in most cases, the data and the forecast that theyprovide differ significantly from that provided by a panel of experts. Thegeneral belief is that since salesmen operate at the grassroots level, theyare more knowledgeable about the demand for products and theaccompanying forecast.

Quantitative Techniques

The majority of the data generated are often unreliable, biased argued by a subjective state of mind of the people making the forecasts.

Also, we think they are clumsy data in the hands of the entrepreneur.

Quantitative techniques in forecasting, however, are less subjective andare more or less based on past data.In the main they are mathematical in nature and tend to be more accurate. One of the quantitative techniques used is the time seriesapproach. The time series approach generally has become very popularwith analysts who are trying to forecast the demand for a good orservice. The general feeling is that time is a crucial explanatory variablethat explains the future. According to this thinking, past data can explainrelationships between the demand of a commodity and time. Forexample, we can display the relationship between demand and time in agraphical way.

4.0 CONCLUSION

We have fully discussed the demand analysis. We discussed theanalytical framework for preparing a demand analysis. We alsodiscussed the analysis of a population data which we said is very crucial.

We defined demand and discussed the evaluation of market size andthen went further to discuss the forecasting of demand.

5.0 SUMMARY

Understanding demand analysis is our first practical step towardsunderstanding the format of a market.

6.0 TUTOR-MARKED ASSIGNMENT

Why do you think that the analysis of a population data is importantwhen building a demand analysis?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: Impressed
Publishers.

UNIT 3 SUPPLY ANALYSIS

CONTENTS

1.0 INTRODUCTION

In Unit 2, we discussed demand analysis which basically looked at themarket from the demand side. In this unit, our task is to look at themarket from the supply side. Basically when an investor iscontemplating an investment in the manufacture of goods for themarket, he/she tries to evaluate the nature of the market for the proposedgoods or services. Understanding the nature of the market will involveunderstanding demand as well as supply.

Supply analysis in project analysis tries to focus attention on the supplyside of the market. The potential investor will like to know who the current suppliers of the goods or services are. Because this will guidehim/her in understanding what is known as the demand/supply gap.

Supply analysis tries to identify the supply of given goods or services. Ittries to identify who the suppliers are and their locations.Generally, in measuring the supply of a good, the following should betaken into consideration:

- The domestic supply of the good or service;
- The foreign supply of the good or service. (the imported quantity);and
- The export of the good or service (export quantity).

2.0 OBJECTIVES

At the end of this unit, you should be able to:
• explain what a supply analysis is
• discuss it in relation to project evaluation.

3.0 MAIN CONTENT

3.1 The Supply Equation

Consider a firm called Fiyinfunoluwa Nigeria Limited that wishes to set up aliquid soap manufacturing plant in Nigeria. The firm now wants toanalyse the supply of liquid soap in Nigeria. As we have said, there arethree key items to consider. Those three items are:
• The domestic supply of the liquid soap;
• The foreign supply of the liquid soap;
• The export of the liquid soap in question.
Let A = the domestic supply of a good
B = the foreign supply of a good
C = the export of the good
Then supply X = (A + B) – C.
This is called the supply equation.
You will notice that C is the exported quantity and which will not beavailable for local consumption.

Table 17: Value of Output of Selected Items

Products	**N,000**
Food and Drinks	
Flour	4,125,417
Sugar	350,333
Confectionery	1,002738
Biscuits	4,700,211
Beer	3,665,544
Soft drinks	124,668
Wine spirit	84,598
Electrical Equipment	
Refrigerators	244,228
Record Players	n.a
Loud speakers	13,204
Radio cassettes	3,680
Air conditioners	319,361
Television sets	2,528
Electrical cables	48,969
Vehicle Assembly	
Motor cycles	235,633
Passenger cars	1,447,874
Pick up	n.a
Other commercial vehicles	1,078,980

Instruments and apparatus (photos, clocks, etc)	536.4
Miscellaneous manufactured articles	9.1
Arms and ammunitions	0.0
Works of art, collector pieces and antiques	0.1
Other goods and product	40.9

Table 19: Imports by Product Section

Description	(₦ Million)
Live animals and animal products	108,636.4
Of which live animals	97.7
Vegetable products	103,549.2
Food industry products	84,374.6
Of which tobacco products	14018.3
Fats and oil	4,823.8
Mineral products	88,348.1
Chemical and allied products	133,367.4
Plastic, ethers, esters of cellulose, rubber, etc.	121,732.9
Hides, leather and fur	2,432.4
Wood, charcoal and wood products	4048.3
Paper-making material and articles thereof	44,498.2
Textiles and textile article	27,775.7
Footwear, headgear, umbrellas, feathers, hair	3,258.6
Stone, plaster, cement asbestos, mica products	15,568.2
Natural pearls, gemstone and other precious metals	44.4
Base metals and articles of base metal	136,046.2
Machinery and appliances (other than electrical)	409,123.4
Transport equipment	265,034.9
Instruments and apparatus (photos, clocks, etc)	13,464.9
Miscellaneous manufactured articles	9,357.58
Arms and ammunitions	23.3
Works of arts, collector pieces and antiques	6.6
Specials items.	48.4

3.2 Analysing Supply Data

We have agreed that the investor should evaluate the market in terms ofdetermining the level of supply of the goods or service in the market.

But in practical terms, there is the urgent need to identify every supplierand the suppliers' location. This will assist in the preparation of amarketing plan. Some analysts believe that getting information on theactual supply data is all that is important. That is not true. In practicalterms, there is the need to find out the following facts about supply in anindustry:

• No. of players or suppliers in an industry;

• Their current installed capacities;
• Their current actual operating capacities;
• Anticipated expansion plans;
• Critical labour costs in the industry;
• Raw materials costs in the industry and the likely direction; and
• Categorising the suppliers into their various categories – big,medium or small players.

SELF ASSESSMENT EXERCISE

Explain the supply equation and its relevance.

4.0 CONCLUSION

The supply analysis attempts to identify the components of the supply ofgiven goods and services as well as the supplies and their locations.

5.0 SUMMARY

The supply analysis seeks to analyse the supply of goods and services. Itenables the would-be-investor or analyst to have a clear picture of thesupply in the market place. Understanding supply is a must if we are tounderstand the nature of competition in industry.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the three components of supply that make up thesupply equation.

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 4 COMPETITION AND MARKETING PLANS

CONTENTS

1.0 INTRODUCTION

We have discussed market demand when we were looking at marketanalysis. We also discussed supply. We now want to move ahead andsee how both of them interplay in what is known as the market.

In this intellectual journey, we have put ourselves in the shoes of the would-be investor or analyst who wants to understand the nature ofcompetition in the market. Every firm takes market demand as given andno firm can single-handedly change demand which we said depends ona lot of factors. Also, every firm takes supply to the market as givenbecause no firm is able to control the supply to the market from othercompetitors.

It is because of this that we really need to understand the nature ofcompetition in the market. Every dynamic environment createsopportunities and problems for firms. A company must be able torespond constructively to this market setting, analyse the opportunitiesand threats, and then formulate marketing plans to remain in thecompetition.

2.0 OBJECTIVES

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

- explain the meaning of competition
- discuss marketing plans and how they are designed.

3.0 MAIN CONTENT

3.1 Analytical Framework

We know where we are coming from and we also know where we aregoing. Our task is to discuss the competition and also the marketingplan. To guide us so that we do not forget our direction, we shall have our proposal an outline – a type of framework that should guide us whenevaluating competition and also the design of marketing plans.

Marketing plans are very crucial from the point of view of the projectinitiator as well as from the project evaluator.

Table 20: Competition: A Framework for Analysis

Industry Outlook	Demand for the product or service Usefulness and desire Stability of demand Supply capacity of industry Labour costs Raw material costs Taxation Permits Regulation
Company's Position in the Industry	Market position of the firm in the industry Products offered Standing of the products The location of the firm Comparative location Relative efficiency of the firm's equipment cost advantages Relative financial strength Ability of company management

3.2 The Nature of Competition

In every industry, competition exists. It is not a matter of sheer bad luckor coincidence. Competition occurs because every firm in an industrywants to sell its products and also get market share to the detriment ofother players.

In the market, the state of competition depends on five basic forces asshown in Figure 5 Therefore, any discussion on competition must takeinto consideration these five basic forces since they cannot be glossedover. The first force exists within the industry where we see firms alljockeying for position. Here, all firms unleash their strategies and fighteach other. In the end, some firms emerge as clear leaders, some emergeas followers, while others might close shop.

The second force is the threat of new entrants. New entrants into anindustry bring in new capacity. But we should note that the threat ofentry depends on the barriers present and also the reaction of existingplayers. We should also not forget the forces arising from suppliers.

Strong suppliers can exert strong bargaining power on marketparticipants to the extent of raising prices and influencing the price ofgoods generally. Powerful buyer groups, when they exist in an industry,tend to influence prices since they more or less dictate the price at whichthey will buy.

Finally substitute goods or the threat of substitute goods also influencecompetition in an industry. Substitute goods tend to limit the potentialsof an industry. For example sugar tends to limit the honey industry'spotentials for growth and expansion.

SELF ASSESSMENT EXERCISE

In evaluating the outlook for an industry, list and discuss four items thatyou think are important.

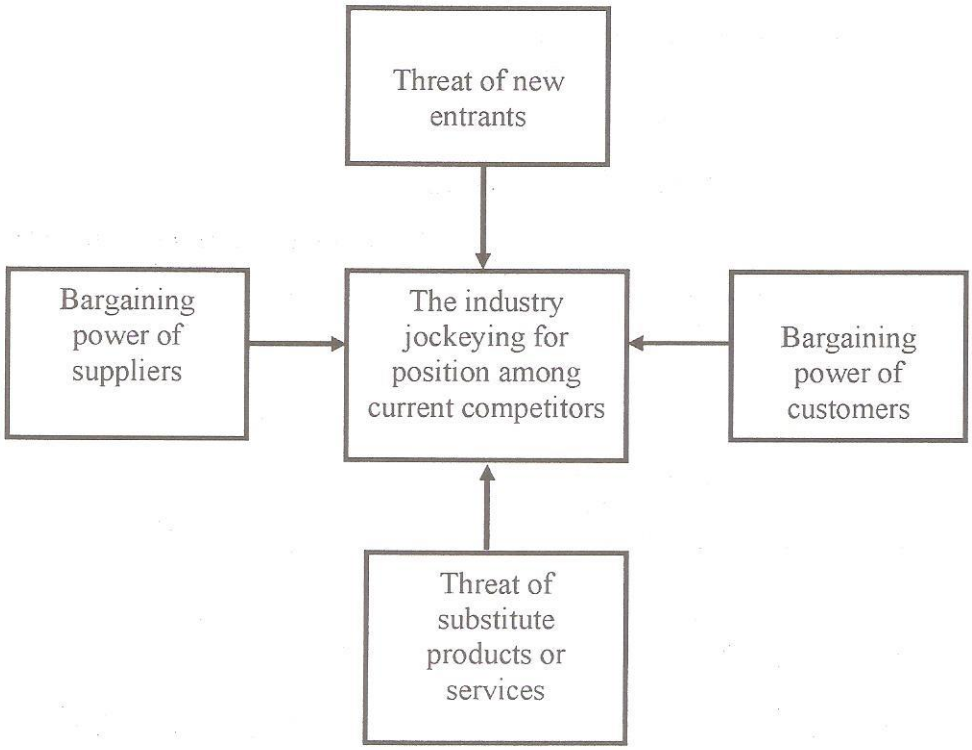

Figure 5: Forces governing competition in an industry

3.3 The Marketing Plan

The marketing plan addresses issues concerning the marketing of theproducts. It tries to relate the firm to its external consumers andThe market.

The marketing plan should answer the following questions:

- What is the product or service?
- What are the uses of the product or service?
- What is the offered price?
- Where will the product be found?
- How will the product or service be advertised?

Table 21: The Marketing Pan Checklist

	Have you covered this in the plan?
How big is the market? Who are your competitors? How are they faring? What is the structure of the competition? What are your competitors' prices? What are your prices? What are the trends in the market? What market share are you thinking of?	

Table 22: The Marketing Plan Checklist

	Have you covered this in the plan?
What are your competitors' strengths? What are your competitors' weaknesses? What is your strength? What is your weakness? What is your competitive advantage? How will you distribute your goods? How will you promote your goods? What is your customer service policy?	

4.0 CONCLUSION

In this unit, we have discussed competition and marketing plans. Wehave also discussed the analytical framework for discussing competition. Apart from these, we have provided a check list formarketing plan.

5.0 SUMMARY

We have discussed competition and marketing plans. We saw howcompetition and marketing plans relate to each other. The framework foranalysis presented discussed industry outlook and a company's positionin the industry.

60 TUTOR-MARKED ASSIGNMENT

Discuss the five basic forces that govern competition in industry.

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

Michael E. Porter. (1980). Competitive Strategy: Techniques for*Analyzing Industries and Competitors. New York: Free Press.*

UNIT 5 PROJECT COST ANALYSIS

CONTENTS

1.0 INTRODUCTION

In Unit 4, we discussed competition and marketing plans. We saw howcompetition takes place in the market place. We also discussedcomponents of marketing plans as prepared by project initiators. Themarketing plan as we discussed is very important to both the projectinitiators and the evaluators.

In this unit, we shall discuss project cost analysis which is very important in this course.

2.0 OBJECTIVES

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

- explain what project cost analysis is
- discuss how the analysis can be prepared.

3.0 MAIN CONTENT

3.1 Project Cost Analysis

Project cost analysis provides total frameworks for calculating orestimating the total cost of a project. For example, a firm wants to set upa garri processing plant to enable it serve the food needs of a growingpopulation. How does the firm know the cost of the envisaged garriprocessing plant?

To guide our discussions, let us define project cost as all those costs thatare incurred in the process of setting up a project. The costs must beattached to the project. And the list of the items must be exhaustive. Butwe need to arrange the cost items in an orderly and consistent manner sothat like items stay together. To ease our discussions and to make themas easy as possible, we shall divide project cost items into the followingsub-headings:

- Cost of land
- Cost of building
- Cost of machinery and equipment
- Cost of utilities
- Cost of furniture and other fittings
- Cost of vehicles
- Pre-operational expenses
- Working capital

Although we have listed the cost sub-headings, we shall go ahead andprepare a small checklist that will guide us. After the checklist, we willwork through a practical demonstration using a vegetable oil refiningplant as an example.

Table 23: The Cost of Land -A Checklist

	Have you included this in your cost?
Cost of purchase of the land	
Cost of Surveying of the land	
Cost of certificate of occupancy	
Cost of Legal documentation	
Cost of perimeter fence	

Table 24: The Cost of Building –A Checklist

	Have you included this in your cost?
Cost of architectural design	
Cost of structural designs	
Cost of electrical designs	
Cost of factory buildings	
Cost of offices	

Table 25: The Cost of Machinery/Equipment- A Checklist

	Have you included this in your cost?
Cost of locally purchased machinery	
Cost of imported machines	
Freight and insurance costs	
Custom duties and other costs.	
Installation and commissioning costs	
Test running costs	

Table 26: The Cost of Utilities -A Checklist

	Have you included this in your cost?
Cost of private transformer	
Cost of generator	
Cost of water bore hole with fittings	

Table 27: The Cost of Vehicles -A Checklist

	Have you included this in your cost?
Cost of vehicles for management	
Cost of vehicles for other staff	
Cost of distribution vans	
Cost of distribution Lorries	

Table 28: Working Capital Checklist

	Have you included this in your cost?
Purchase of raw materials	
Purchase of diesel/fuel	
Payment of salaries	
Administration costs	
Selling costs	

SELF ASSESSMENT EXERCISE

List and explain 10 items which you think should appear in a project cost analysis of a start-up sachet water manufacturing plant.

A Worked Example

Analysis of Project Cost in a Vegetable Oil Refining Plant

Estimates of Project Cost		**N**
Land for the project		4,000,000
Civil works and foundations		5,000,000
Steel Structures		
Includes H Beams, U channels,		
Angles, checker plates, Railing pipes,		
Roofing materials	-	13,000,000
Total Land, Buildings and Steel Structures	-	**22,000,000**
Storage Tanks		
2 units' crude oil tank – 200 tons	-	3,000,000
1 unit refined oil tank- 300 tons	-	2,000,000
1 unit fatty acid tank – 50 tons	-	850,000
1 unit water storage tank – 20 tons	-	750,000
1 unit diesel storages tank – 20 tons	-	750,000
1 unit furnace oil tank – 20 tons	-	750,000
Sub-Total	=	**8,100,000**
Utilities		
1 unit 500 KVA transformer	-	3,500,000
1 unit 500 KVA generator	-	10,000,000
1 unit water bore hole	-	500,000
Sub-Total	=	**14,000,000**

Machinery and Equipment (Imported)

Full line vegetable oil refining plant consisting of the following:

- Continuous oil pre-treatment section
- Continuous bleaching section
- Continuous physical refining and deodorising section
- Thermal oil heating units
- Water cooling system
- Steam generation and distribution system

		N
Total C & F Lagos U $ 695,000*N132	=	91,740,000
Bank charges (L/C etc)	=	500,000
Port clearing and other Misc. charge	=	6,500,000
Total: machinery and equipment	=	**98,740,000**

Pre-Operational Expenses

Feasibility studies	=	300,000
Project management consulting services	=	500,000
NAFDAC for registration/documentation	=	150,000
Travels and tours (local and overseas)	=	500,000
Total: pre-operational expenses	=	**1,450,000**

Summary of Project Cost

Land, building and steel structures	=	22,000,000
Machinery and equipment	=	98,740,000
Storage tanks	=	8,100,000
Utilities	=	14,000,000
Pre-operational expenses	=	1,450,000
Sub-Total	=	**144,290,000**
Working capital	=	**30,617,994**
Project Grand Total	=	**174,907,994**

Analysis of Working Capital Requirements

		N
One week purchase of raw materials	=	29,697,261
One month factory salary/wages	=	482,820
One month diesel, oil and lubrication expenses	=	437,913
Total	=	**30,617,994**

Table 29: A Proposed Financing Plan (N)

	Project Sponsor	Bank	Total
Land, building and steel structures	9,000,000	13,000,000	22,000,000
Machinery and equipment	20,800,000	77,940,000	98,740,000
Storage tanks	-	8,100,000	8,100,000
Utilities	14,000,000	-	14,000,000
Pre-operational expenses	1,450,000	-	1.450,000
Sub-Total	45.250,000	99,040,000	144,290,000
Working capital	30,617,994	-	30,617,994
Total	**75,867,994**	**99,040,000**	**174,907,994**

4.0 CONCLUSION

Project cost analysis is an important aspect of our study of projectevaluation. Project cost analysis is important to both the project initiatorand the financial analyst who may want to evaluate a project.

5.0 SUMMARY

In this unit, we discussed project cost analysis. In doing this we agreedthat cost of land, buildings, machinery and equipment, utilities, furnitureand fittings, etc., all form part of the total project cost. We also used acheck list to guide the preparation of the cost analysis. Finally we used aworked example of a vegetable oil refining plant to throw more light onthe project cost analysis.

6.0 TUTOR-MARKED ASSIGNMENT

Why do you think that it is important to know the total cost of a project?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.
Wearne, S.H. (1989). Control of Engineering Projects. London: ThomasTelford.

UNIT 6:ELEMENTS OF PROJECT ANALYSIS

CONTENTS

1.0 INTRODUCTION

In this unit, we will discuss the elements required to do a project analysis. The section firstly defines the term element and identifies possible elements in project analysis. Secondly it examines six main elements and other possible element of project and project analysis. When these elements are present, the tools of project analysis and appraisal will work and be appropriate.

2.0 OBJECTIVES

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

- identify the elements of project analysis.
- explain the six main elements of project analysis

3.0 MAIN CONTENT

3.1 Elements of project analysis defined and identified

Some basic elements are fundamental to project analysis and project success. Elements of project analysis are basic or essential parts or principles of which project consists, or upon which the fundamental powers of project analysis are based. Similarly, elements of project analysis can be described as characteristic parts of a project analysis.

Some basic elements of project and project analysis have been identified by various authors. To one, they are time,cost, and quality (or scope). And another identifies time, quality, and resource expenditures. Yet to another, they are resources, time, cost, risk and scope. In this unit, we identify the main elements of project analysis asresources, time,cost, quality, risk and decision rule.Each element must be managed effectively. All these elements are interrelated and must be managed together if the project is to be a success.

3.2 Basic Elements of Project Analysis

The following six elements have been identified as important in project analysis. The order of the factors is a function of the task that is the most important part of doing the project analysis. It various from one project to another, however, they are interrelated,

Element 1 - Resources

All projects involve the commitment of resources now to obtain extra resources in the future. These are resources assigned to the project. The labour hours of the project team are included also.There are four types ofresources available: men, machines, money, and materials (the four

M's). “Men” includesthe human (people) resources of the project.The people resources mean having the right people, with the right skills and the proper tools, in the right quantity at the right time. Machines are the resources used for a project that stillexist after the project is over such as trucks, meeting rooms, and so on. They also means equipment (cranes, trucks and other heavy equipment) used for the project Materials arethe required resources that are used up or transformed during the project. They also meanthe materials (pipe, insulation, computers, etc) assigned to the project. Last of all is theresource that project analysts pay the most attention to during projects, Money. However,this is only one resource not the only resource. In fact, for many projects there is no realmoney involved. Internal projects use peoples time but not real money. That money would be spent if the project was done or not, therefore, it is notthe project that costs this money. The only money assigned to the project is actual nairathat would not have been spent if the project was not performed. This includes specialconsultants and contractors used for this project. Resources can be traded for one anotherand that is why they are lumped into a single category. Resource Expenditures become thenumber one factor when we are limited in our use or the availability of any of the above.

Element 2 - Time, Timing and Schedule

Time is a critical element for any successful project analysis. Time and Timing are different. Time means the absolutetime of the project, a specific moment, such as starting the road construction.Regulatory projects and many competitive projects may be driven by Time. Hence time become a very important element in its analysis. Unfortunately, manyprojects are given short deadlines in the hope of forcing the project to be done faster. This isludicrous. It may work once but not always.

Timing includes projects that are not necessarily driven by the end date (although this couldbe part of it) but are driven by the close interdependency in time from one task to the nextsuch as mixing and pouring concrete in drainage construction. The timing of cash flows is also important here because of the time value of money – that is cash inflows and outflows on a timely basis.

The most common cause of bloated project budgets is lack of schedule management. Fortunately there is a lot of software on the market today to help you manage your project schedule or timeline. Any project can be broken down into a number of tasks that have to be performed. To prepare the project schedule, the project manager has to figure out what the tasks are, how long they will take, what resources they require, and in what order they should be done.

Analysis can take place at any time in a project. However, the most appropriate timing will be governed by the nature of the project, and the reason for carrying out the analysis. It will be most effective when it is built in as a fundamental part of your overall project, and should be considered while the project is being designed.

You may decide that you will:

- carry out an initial baseline exercise against which to compare progress at the end of the project
- refine the project on an ongoing basis; therefore, analysis will be part of your regular project activities

  or
- evaluate the project at agreed milestones, for example on a bi-monthly basis.

Apart from required reporting on the project, the timing and intensity of a project's analysis is up toproject participants. Many coastal management actions will benefit from being evaluated over a longerperiod of time, such as one to five years after the project has been completed. This can allow for the impactsof management action on aspects such as dune stability and vegetation health to be evident.

Projects must have a definite start date and stop date. This is importantas the start and stop date define the life cycle of the project as identify in previous unit. Everything born eventuallydies. Everything has a lifecycle. By knowing the lifecycle of something we also know a lotabout it simply by knowing where we are in that lifecycle. When receiving a new project consider the most pressing question at that moment.You want to know "What" you are being asked to create. Answering this questionrequires nouns. We must identify what we are being asked to create. We may state we are building a house, car, or software application. In any event, it is the

identification of allthe nouns or things we are to create that determine our project. However, knowing “what”we are going to create is not adequate; we must also know the requirements for each thing.That is, we must describe the “what” in enough detail that we can feel confident in creatingit. We use adjectives to describe our nouns. These are known as “requirements.” The outputs of this phase are the scopestatement and requirements.

Once we feel confident in “what” to create the next question is “how will we create it?”what are the steps, who will do them, when will they be done? This phase is characterizedby the verbs that describe the actions required to create the “what.” When completed, thisphase has the schedule as its primary output.

Element 3 - Costs

In project analysis, the ability to do a project within budget is applauded. The project cost is the initial price of the project including the working capital. For example, the cost of acquiring borehole equipments could be ₦7million but it may require about ₦2.5 million to set up the drilling equipments. The extra ₦2.5 million must be considered as part of the initial cost of the project because without incurring that cost, the drilling cannot commerce. The extra cost the project would incurred before the project can commerce is fundamental to project analysis. The omission of this aspect has stalled many projects in government.

Furthermore, project cost can be broken down into three components – *initial expenditures, replacement expenditures and residual values*. *Initial expenditures* refer to the cost involved in establishing and commissioning project. Replacement expenditures refer to the cost of equipment and other investment items in the operating phase of a project to maintain its productive capacity.

The *residual values* refer to the value of all these investment items at the end of the project life (that is, when production is expected to cease or be substantially changed).

Similarly, project costs is said to include *estimated cost, actual cost and variability cost*. The *estimated cost* is a written statement indicating the likely cost/price that will be charged for specific project. The *actual cost* is the market or current cost/price that will be charged for specific project. *Contingency cost* takes into account influence of weather, suppliers and design allowances.

Price is an important factor here. Price deals with the valuation of the project estimated effects (cost and benefit). Price can be in two forms:

(1) constant prices – estimated effects value at a specified set of prices; and

(2) current prices – an attempt to forecast price in the future.

The constant price is generally use for project analysis.

Element 4 - Quality

Quality is the distinctive attribute or characteristics of a project(s). It describes the standard or degree of excellence of the project. Quality becomes the number one factor in project analysis when the client wants the product or service to beexactly as specified. Consider the product Microsoft Word. Is this a high or low grade product? It's obviously high grade. There are hundreds of features. Nowconsider the quality of the product, high or low? The quality of Word is somewhere in themiddle. I wouldn't classify it as high quality by any stretch. It crashes and misbehavesendlessly. However, it does work most of the time. It's well known that as grade

increases,quality becomes a bigger challenge. The more features a product has the more difficult it isto ensure all of those features work as promised and expected. The converse is true as well.The fewer features a product has the easier (usually) it is to make sure they all work.Adding features increases cost and the challenge of making all those features work. Inaddition, it takes longer to create additional features.

Element 5 - Risk

In the face of scare resources, there is greater need to investigate the risk involved in any project of investment an organization want to commit fund in order to minimize its effect. This enables projects to be analyze in view of the changing variables in the environment – government policies, consumer income, culture of the people and their values, inflation, technology and world economy. A change in these variables will certainly increase the risk in our project and has implication for project analysis.

Risk is the variability in the size of possible returns in an investment. It could be describe in two forms:

- a situation where there is incomplete predictability of alternative events;
- a situation in which parametric knowledge of probability distribution is used to assess a set of alternative event.

Also, risk is complex in nature because it involves the assessment of uncertain future events which are difficult to predict. In project analysis it is incorporated in the required rate of return (the discount rate).

Decision Rules

A feature of project analysis is the ability to make decision on what project to invest in at a given time. These guidelines can be grouped as two basic decisions facing project analyst. They are:

- Accept or reject decision problem, the analyst has two options to whether accept or reject a particular project. To make this decision, there must be an appropriate rule for judging the economic worth (profitability) of an investment project. If a project is profitable it is accepted, if not, it is rejected.
- Select from alternative the best project: in the face of limited resources acting as a constraint or when working with a given project, the best project or most profitable project is selected, others are sacrificed or forgone. The projects are said to be mutually exclusive, that is, the choice if one preclude the other.

3.3 Other Elements of project analysis

Unique

Projects are unique, one-of-a-kind, never been done before. It'simportant to know what it means to be "unique" if we hope to separate the common fromthe uncommon. In the performance of a project, there is an enormous amount of work to bedone. Some of it will be unique and some of it will not. The tools of project analysis are designed to control and manage the uncertainty inherent in projects. We must therefore,separate these two types of work and apply project tools to the unique work and operationaltools (when required) to the common work. Of all the work required to bring a project in ontime and on budget only some portion of it will be unique.Only some part of all the work required will be unique and therefore "project" work.The rest of the

work is operational work. We must apply project tools to project work andoperational tools to operational work.The “project”only analyzes and plans for the unique work.

One Accountable Entity

Accountability implies someonethat has both the responsibility and the authority to do the work of the project.Because operations have clearly defined and segmented work that is repeated over and overit is possible to have separate entities accountable for each section of the work. This controlcomes through the well defined processes that drive the work. In projects, there are few welldefined processes for the work (actually, the processes of planning and managing a projectare operational while the work of the project is unique). The project plan represents the besteffort to create a one time process that will have many missing parts. Such uncertaintyrequires one person to have full accountability for all the work of the project. This does notmean the same person must remain the one accountable entity for the entire project. Somepeople are very good at getting the team organized and planning the project but fail whenit's time to drive the details of daily work. Feel free to change project leaders at each phaseif it’s necessary. If you intend to change leaders at strategic points in the project make sureeveryone knows up front to prevent rumors of leadership failure.

Now that we see why we need one accountable entity let's define the term. Accountablemeans to answer to somebody for your actions. Responsible means someone who has theconfidence to boldly state, "Fire me first" when things don't work out. The accountableentity knows the phrase "the buck stops here" and provides no excuses for failure. It meansto be *responsible* and have *authority*. Being responsible is the "no excuses" part of the job.Authority means to be able to make sound decisions that guide the project. If theaccountable entity is unable to make decisions, he cannot manage the project.

4.0 CONCLUSION

We conclude that resource, time and timing, cost, quality, risk, decision rules, unique and one accountable entityare elements of project and project analysis. They are well discussed in detail in this unit.All these elements are interrelated and must be managed together if project and project analysis, is to be a success.

5.0 SUMMARY

In this unit, we have identified various elements of project and project analysis. They are resources, time and timing, cost, quality, risk, and decision rules. We have also discussed them in detail.

6.0 TUTOR-MARKED ASSIGNMENTS

4. Identity the basic elements of project analysis and briefly discuss any three.
5. Explain decision rules as it relates to project analysis.

7.0 REFERENCES/FURTHER READINGS

Curry, S. & Weiss, J. (1993). *Project Analysis in Developing Countries.*Britain, Palgrave Macmillan.

Elder, A. (2006).The five elements of a project. No Limits Leadership Inc. 1-10.

MODULE 3

UNIT 1 PROJECTED INCOME STATEMENT

CONTENTS

1.0 INTRODUCTION

In Unit 5 of Module 2, we discussed project cost analysis. We discussedhow to cost a project, especially a start-up project. We saw that fixedcosts and working capital all add up to constitute the project cost. In thisunit, we shall discuss the projected income statement which is a veryvital statement required for project analysis and evaluation.

The key basis for financial planning and project evaluation is financial information. The financial information is required to record,compare and evaluate a firm's earning power and ability. In an alreadyexisting project, the financial information is already provided since it isa historical data. The income statement or the profit and loss account is asummary of revenues, expenses and net profit of an enterprise for aperiod of time. This serves as a measure of the firm's profitability overthe period. For an on-going project or firm, when prepared, the incomestatement becomes a historical statement. The projected incomestatement is a forecast of the revenues, expenses and the net profit of anenterprise or project.

2.0 OBJECTIVES

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

- explain the meaning of projected income statement
- discuss its application in project evaluation
- prepare a projected income statement.

3.0 MAIN CONTENT

3.1 The Projected Income Statement

The projected income statement is usually needed by a variety of people.Some of the users of the projected income statement might have direct interest in the firm while others have indirect interest.The owners or sponsors of a project have a direct interest inthe projected income statement. It is so because they are entrusting theirinvestment to the firm. They wish to know before hand what therevenues, expenses and net profit of the firm will be, and mostimportantly, their own expected dividends.

Another important group that is expected to have a direct interest in theprojected income statement of a project is the management. Usuallywhen a project is conceived and a project plan is written, the plan willcontain the projected income statement as conceived by the projectsponsors or consultants. Usually, the projected income statement ishanded down to the project managers as a guide.

Also financial institutions are interested in a projected income statement.

Practically, when any firm approaches a financial institution forfinancial assistance, the firm is expected to prepare a business plan or aproject feasibility study which contains, amongst other things, theprojected income statement. Financial institutions need to study theprojected income statement to evaluate the revenues, expenses andprofitability of the investment project. When they do this, they will alsotest the cash flows of the project to see whether the proposed project canrepay any loan granted together with the interest.

Other people that might be interested in the projected income statementare potential investors. Potential investors need to examine the projectedincome statement to decide whether or not they will invest in a firm.

3.2 The Structure of the Projected Income Statement

We have just explained what the projected income statement is. It is astatement that shows projected revenues, projected expenses, and ofcourse, net profit of a proposed investment, an expansion project or anexisting project.

In the standard practice, there is an acceptable arrangement that shouldgroup like items together and this leads to building a projected incomestatement that is broken into revenues, expenses and the net profit.

• Revenues

Ordinarily, revenues are the value of output of goods or services that anenterprise supplies to its customers. Revenues, therefore, arise when afirm produces or manufactures goods which it sells to third parties for afee. Secondly, revenues can arise when a firm is engaged in the buyingand selling of goods. It purchases goods which it later resells at a profitor a loss as the case may be. Thirdly, revenues can also arise throughprovision of services by a firm. A hospital may specialise in surgery andprovide surgical services to its customers for whom it collects relevantpayments, which when added up, make up the revenues.

Finally, a firm can earn revenue by loaning its economic resources. Forexample, a bank lends money to customers and earns interest income.

The interest earned is revenue.In projecting for revenues in a project situation, care must be taken sothat proper estimates or forecasts are made. And this is made qualitative judgment plus quantitative judgment on the part of the project evaluator. For example, if the project is a manufacturing facilitythat will produce goods for the market, the best option is to start with theknown market price of the good to be produced. For example, if thegood in question is the type of bread that sells for N100 a loaf, then theproject evaluator or initiator has to start from the known price of a loafof bread and that is N100 a loaf. If the number of loaves of bread to beproduced per annum amount to 1,000,000 then the projected revenue ofthe project is N100,000,000.Likewise, if a firm is engaged in the provision of services, the revenueslikely to be earned can be easily estimated. If for example a hospital isprojecting revenues, it has to first estimate the likely number of patientsthat will use its facility and also the average fee it charges a patient. Thenumber of patients multiplied by the average fee per patient will give usthe projected revenue of the health facility.

The projection for revenues can cover various periods. In mostorganisations, revenue projections for project evaluation purposesstretch over a period of three years. Some banks ask for fiveyear revenue forecasts. In the revenue projections care must be taken so asnot to overstate the revenues or understate them.

• Expenses

The cost of earning revenue is known as the expense. Expenses aredifferent from costs. Cost is the outlay incurred to acquire some asset.

For example, when a car is purchased by a company for its business, thesum used to purchase the vehicle is the cost of the vehicle. If the vehicleuses fuel for the firm's operations, that constitutes an expense.In projecting the expenses of a firm's investment, a lot of factors areusually taken into consideration.

Firstly, we have to get proper estimates of the current cost profile of thevarious items. For example, when projecting gas and oil expenses of aproject, the proper starting point is to collect data on the current pricesof gas and oil.

Revenue Projections

From the proposed production plan, the following is the revenue profilefor the project in year one (year 2007).

Table 30: Revenue Projection for a Vegetable Oil Refining Plant

Table 30: Revenue Projection for a Vegetable Oil Refining Plan

Projected Year One Revenues

Product	Quantity Sold (Tons)	Price Per Ton N	Total Revenue N
Refined Vegetable Oil	12,498	145,000	1,812,210,000
Palm Kernel Cake (PKC)	18,418	5000	92,090,000
Palm Kernel Sludge (PKS)	1,315	4000	5,260,000
Fatty acid	657.84	100,000	65,784,000
Total			**1975,344,000**

Consumption of Utilities and Chemicals per Ton of Bleached and Refined Vegetable Oil

Steam at 50 psig = 70kg
Barometric water = 6 m3
Clean water in circulation = 7 m3
Fuel oil = 4 kg
Bleaching earth = 15 kg
Citric acid = 200 gms
Phosphoric acid (for dosing) = 300 gm

Vegetable Oil Packaging Expenses

The refined vegetable oil will be sold in two ways:

1. Direct to vegetable oil distributors who will purchase thevegetable oil in tanker loads. In this case, the vegetable Oil tankers will come and load vegetable oil at the factory.
2. The refined vegetable oil will be filled into plastic jerry cans of 9litres and 18 litres capacity and also sold to the market. The purpose ofthis is to ensure that the brand of vegetable oil will be in affordableunits and prices to the market.

Table 31: Projected Manufacturing Account for a Vegetable Oil

Table 31: Projected Manufacturing Account for a Vegetable Oi Refining Plat

Projected Manufacturing Account for Year Ending 31st December

	2007	2008
Opening raw materials	10,000,000	15,000,000
Raw materials purchased	1,544,257,610	1,544,257,610
	1,554,257,610	**1,559,257,610**
Raw materials at close	15,000,000	9,000,000
Raw materials consumed	1,539,257,610	1,550,257,610
Add Factory Overheads		
Diesel, oil and lubricant	5,254,959	5,517,707
Factory uniform	110,000	-
Electricity and light	3,721,819	3,907,910
Plant/Machinery repairs	3,002,287	3,152,401
Laboratory consumables	438,820	500,000
Laboratory equipment repair	50,000	80,000
Generator Repairs and maintenance	8,46,556	888,883
Weighbridge fare	290,122	300,000
Salaries and wages	5,793,840	6,083,532
Welding gas	218,499	240,000
Cleaning and sanitation	87,595	90,000
Depreciation	17,248,071	17,248,071
Total factory overheads	**37,062,568**	**38,008,504**
Cost of manufactured goods	**1,576,320,178**	**1,588,266,114**

Table 32: Projected Expenses for a Vegetable Oil Refining Plant

Projected: Selling and Distribution Expenses

	2007	2008
Selling and Distribution Expenses		
Advertising	5,000,000	5,000,000
Car and bus running expenses	1,782,230	1,871,341
Transports and travelling	2,185,317	2,185,317
Loading and off loading	586,050	586,050
Gifts, entertainment, donations	293,306	293,306
Public relations	418,813	400,000
Total	**10,265,716**	**10,336,014**

Administrative Expenses		
Printing and stationery	310,324	325,840
Truck repairs & maintenance	585,862	615,155
Telephone, courier & postages	900,000	900,000
Consultancy fee	120,000	130,000
Security expenses	102,072	107,175
Medical expenses	1,038,632	1,090,563
Audit fee	120,000	120,000
Building maintenance	389,942	409,439
Directors remuneration	7,200,000	7,200,000
Interest and bank charges	16,000,000	12,000,000
Insurance premium	350,000	350,000
Salaries & wages (office)	3,257,100	3,419,955
Depreciation provisions	1,889,544	1,889,544
Total	**32,263,476**	**28,557,671**

Table 33: Projected Trading, Profit and Loss Account for a Vegetable Oil Refining Plant

Projected Trading, Profit and Loss Account for the Year Ending 31st December

	2007	**2008**
Sales	1,975,344,000	1,975,344,000
Opening Stock	30,000,000	40,000,000
+ Cost of Manufactured goods	1,576,320,178	1,588,266,114
Less Stock at Close	40,000,000	50,000,000
=Cost of Sales	1,566,320,178	1,578,266,114
Gross Profit	409,023,822	397,077,886
Deduct		
Selling and distribution expenses	10,265,716	10,336,014
Administrative expenses	32,263,476	28,557,671
Total expenses	42,529,192	38,893,685
Profit before tax	366,494,630	358,184,201
Tax provision	117,278,281	114,618,944
Profit after tax	249,216,3349	243,565,257

SELF ASSESSMENT EXERCISE

List and explain four expense items that can be found in a projectedincome statement.

4.0 CONCLUSION

We have discussed the projected income statement. We discussed thestructure of the projected income statement, revenues, expenses and netprofit concepts.Finally we used as an example to demonstrate a projected incomestatement.

5.0 SUMMARY

We have treated the projected income statement in this unit. Theprojected income statement is one of the most important items in projectevaluation from the project sponsor's position or from the bank oranalyst's position.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the likely users of a projected income statement.

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 2 PROJECTED CASH FLOW STATEMENTS

CONTENTS

1.0 INTRODUCTION

In Unit 1 we discussed the projected income statement. Therewe discussed he concept of revenues and expenses and also net profit. Wealso discussed the fact that the projected income statement is used by avariety of users like the project initiators, bankers and financial analysts.In this unit, we shall discuss the projected cash flow statements.

2.0 OBJECTIVES

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

- explain what a projected cash flow statement is
- explain how it can be prepared
- explain the usefulness.

3.0 MAIN CONTENT

3.1 Projected Cash Flow Statement – Meaning and Uses

It is important to understand and analyse the projected cash flows of thefirm. We shall begin our discussion by defining a cash flow statement.A cash flow statement is a statement that shows the actual receipt ofcash (inflows) and the disbursement of cash (out flows) of a firm orproject. Having said that, we can now go ahead to define a projectedcash flow statement.

A projected cash flow statement is a statement which shows theforecasts of actual receipts of cash (inflows) and the disbursement ofcash (outflows) of a firm or project. There are many users ofinformation contained in projected cash flow statements. The first userof the projected cash flow statement is the project sponsor or initiator.

The project sponsor or initiator is interested in knowing well in advancethe future cash flows of the firm. This is important because the futurefinancing needs of the firm have to be known well in advance. Theproject initiator needs to distinguish between credit sales and cash sales.

If the project initiator does not distinguish between credit sales and cashsales, then his/her project may suffer cash flow problems. The initiatormay not be able to estimate the amount of cash needs of the project aswell as timing of the cash needs.

Similarly, providers of finance especially the lending banks are usuallyvery interested in the projected cash flow statement. They need todetermine the firm's ability to service debt. The debt in question may beexisting debts or future debts. Ability to service debts is a function offuture cash flows.

Projected cash flow statements assist us to evaluate a firm's futureperformance and of course financial condition that enables the projectevaluator answer the following questions.

• What is the nature of the firm's projected cash flow statement?
• Will the projected cash flow be able to service the project's debts(loan, overdraft + interest)?
• When will the project need financing and to what extent?
• How should the loan or overdraft or finance be structured?
• How stable are the cash flows?

3.2 The Structure of the Projected Cash Flow Statement

The basic format of the projected cash flow statement is displayed inTable 33 is a projected cash flow statement of a company. But it coversa period of only 3 months. You can project a cash flow as long as yourequire but the basic principles should be followed. If you examineTable 33 properly, you will realise that the projected cash flowstatement is divided into two main sections, namely:

1. The cash inflows
2. The cash outflows (outgoings)

We will now go ahead to break down the projected cash flow statement.

Table 34: A Three Month Projected Flow StatementNiger LimitedCash Inflows January

Table 34: A Three Month Projected Flow Statement
Niger Limited

Cash Inflows	January	February	March
Capital introduced	10,000,000	-	-
Loan introduced	20,000,000	-	-
Cash sales	40,000,000	50,000,000	60,000,000
Total Cash Inflows	70,000,000	50,000,000	60,000,000
Cash Outflows			
Raw material	30,000,000	30,000,000	35,000,000
Salary and wages	2,000,000	2,200,000	2,500,000
Office admin expenses	500,000	550,000	600,000
Electricity and gas expenses	500,000	550,000	600,000
Loan repayment	2,000,000	2,000,000	2,000,000
Interest charges	400,000	400,000	400,000
Selling expenses	1,000,000	1200,000	1,300,000
Total Cash Outflows	36,400,000	36,900,000	42,400,000
Cash Surplus/(Deficit)	33,600,000	13,100,000	17,600,000
Opening Cash Balance	-	33,600,000	46,700,000
Closing Cash Balance	33,600,000	46,700,000	64,300,000

3.2.1 Cash Inflows

We have seen that a projected cash flow statement is broken down intothe inflows and the outflows (outgoings). Let us now proceedto examine some of the key items contained in the projected cash flowstatement. The items will vary from capital to loan introduced and alsocash sales. We shall treat them individually.

• Capital Introduced

Every firm or project should have a capital. At the time a project conceived or is being expanded, the owners of the firm usually bring inwhat is known as capital.

In a limited liability company, the share holders usually contribute thecapital of the firm. In cash flow construction, capital is usually enteredas an inflow. The reason is clear. When you introduce capital, you bringin cash.

• Loan

Another item appearing in a projected cash flow statement is loan. Insome cases, a project is funded through loan from banks.

The loan will usually have the following features:

1. The loan amount will be specific
2. The loan has an interest rate attached to it.
3. The loan will be repaid in agreed installments.

• Cash Sales

The sales figure is the most important in a projected cash flowstatement. Projections for sales pose one of the most difficult challengesin cash flow projections. We must quickly distinguish between totalsales, credit sales and cash sales. Total sales are the total value of goodsor service sold to third parties. Credit sales refer to sales for whichpayment is not made immediately. The figure for credit sales is usually

transferred to the debtors list. Cash sales are the difference between total

sales revenue and credit sales.

As far as we are concerned, the cash sale is the mostimportant component of sales and it is the one that appears in the projected cashflow statement. Credit sales are only reflected in the cash flow whenthey are converted to cash. For example, if in January 2007, a companysells four cars at a credit of N10,000,000. In the cash flow for January2007, there will be no entry for cash sales. But if in February 2007, the

company receives a cash payment of N5,000,000, then that figure willappear in the inflows column for February 2007.

The basic rule is that only actual cash received is usually entered in theinflow column.In actual practice, projecting for cash sales will involve exhaustiveconsideration of the following:

• General economic outlook in the country
• The industry outlook. What is the demand situation like? What is thesupply situation?
• What is the structure of competition and how fierce is it?
• What will be the effect of competition on prices in the firm's area ofoperation?

3.2.2 Cash Outflows

Cash outflows or outgoings will include all expenses that use cash. Theywill include items like:
• Raw material expenses
• Salary and wages
• Stationery
• Loan repayment
• Interest charges
• Selling expenses
• Office admin expenses
• Oil and gas expenses
• Taxation
• Rates and permits

3.3 Sensitivity Analysis

Usually, when constructing a projected cash flow statement, the first setof projections is what we call normal estimates of cash flows. Normalestimates of cash flows especially cash revenues are based on all thingsbeing equal; but all things cannot be equal. A lot of things may happen.
In a market, supply can come from unexpected source and cause pricesto fall. Prices of raw materials may rise suddenly and all these tend toreduce our earlier revenue projections and jack up expenses.
Sensitivity analysis provides the tool for subjecting a project'scash flow s to adverse market situations. Sensitivity analysis seeks to adjustrevenues for risk and also costs. In conducting sensitivity analysis, wesay that we are adjusting a project's cash flows for risk. If we conductsensitivity analysis on a cash flow, we may do that by making one, twoor three of the following assumptions:
• Due to intense competition the project will not be able to make theearlier normal sales volume. Cash revenues will drop.
• Due to excess supply, prices in the market will fall, that will reducecash revenues.
• The prices of raw materials and other items will rise. A closeexamination will reveal that the impact of any of the above will havethe effect of reducing the cash revenues of a project.

We now state that if a normal projected cash flow statement isreconstructed to accommodate the fact that the market could be worse,we say that the reconstructed cash flow is now called a risk "adjustedcash flow statement." The risk- adjusted cash flow is a pessimistic cashflow and should be admired by analysts.

Table 34 is a risk-adjusted income statement reconstructed from Table33.The critical assumption is that Table 34 assumes that only 75% ofcash sales of Niger limited will be realised.

Sensitivity analysis is a tool for subjecting cash flows to risk analysis.The key objective of the sensitivity analysis is to forecast a worst-casescenario for a project.

Other ways of conducting a sensitivity analysis is to assume thatexpenses attached to a project will increase.

Table 35: A Three Month Risk-Adjusted Projected Cash Flow Statement Niger Limited

Table 35: A Three Month Risk-Adjusted Projected Cash Flow Statement Niger Limited

Cash inflows	January	February	March
Capital introduced	10,000,000	-	-
Loan introduced	20,000,000	-	-
Cash sales	30,000,000	37,500,000	45,000,000
Total Cash Inflows	**60,000,000**	**37,500,000**	**45,000,000**
Cash Outflows			
Raw material	30,000,000	30,000,000	35,000,000
Salary and wages	2,000,000	2,200,000	2,500,000
Office admin expenses	500,000	550,000	600,000
Electricity and gas expenses	500,000	550,000	600,000
Loan repayment	2,000,000	2,000,000	2,000,000
Interest charges	400,000	400,000	400,000
Selling expenses	1,000,000	1,200,000	1,300,000
Total Cash Outflows	**36,400,000**	**36,900,000**	**42,400,000**
Cash Surplus/(Deficit)	23,600,000	600,000	2,600,000
Opening Cash Balance	-	23,600,000	24,200,000
Closing Cash Balance	**23,600,000**	**24,200,000**	**26,800,000**

4.0 CONCLUSION

MBA 840

PROJECT EVALUATION

We have discussed projected cash flow statements. We discussed thenature of cash flow statements and their users. We also examined thestructure of cash flow statements. We used an example to show what aprojected cash flow statement looks like. We also constructed a riskadjustedcash flow statement.

5.0 SUMMARY

In this unit we treated projected cash flow statements which we saidconstitutes a very vital document used in the evaluation of projects. Thecash flow gives us a picture of cash inflows and outflows together withtiming.

6.0 TUTOR-MARKED ASSIGNMENT

Why do you think that banks are interested in projected cashflow statement of projects?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 3 THE PROJECTED BALANCE SHEET

CONTENTS

1.0 INTRODUCTION

In Unit 2, we discussed the projected cash flow statement. There, wediscussed inflows and outflows (outgoings) of a firm or project. We alsodiscussed the structure of the projected cash flow statement and went astep further to provide an example of a projected cash flow statement.In this unit, we shall discuss the projected balance sheet.

2.0 OBJECTIVES

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

- explain the meaning of a projected balance sheet
- explain the preparation of the projected balance sheet
- prepare a projected balance sheet.

3.0 MAIN CONTENT

3.1 Meaning of a Balance Sheet

Before we delve into the projected balance sheet proper, it is veryimportant for us to first understand what a balance sheet is.The balance sheet or the statement of financial position is one of themost important financial statements. It shows the financial condition orbetter still, the statement of affairs of a firm or business. WeWill therefore, define a projected balance sheet as a forecast of a futurebalance sheet as at a future date.

3.2 Components of the Balance Sheet

The balance sheet has two main sides namely:

- Assets
- Liabilities

3.2.1 Assets

When we are talking of assets generally, we are talking aboutthe valuable possessions owned by the firm, valued in monetary terms. Theywill include land and buildings, stock of goods, raw materials, cash,vehicles and other valuables.

But generally we can classify assets under the following headings:

- Current assets
- Investments
- Fixed assets

Lets us now discuss each of them:

Current Assets

The current assets of a firm or business are those assets which are heldin the form of cash or expected to be converted into cash in aperiod or within the accounting period of the firm. In actual practice, theaccounting period is usually of one-year duration.

The current assets of the firm will include the following:

- Cash
- Book debts (debtors).
- Prepaid expenses
- Marketable securities.
- Stock

Let us start with cash which is one of the most liquid current assets.Cash will mean cash on hand or cash in the bank.

Another current asset which is important is book debts (debtors). Bookdebts are sometimes called account receivables. These are amounts duefrom debtors to whom goods have been sold or service rendered. Someof the book debts may be realised by the firm. If they are not realized they turn into what is called bad debts and may be written off later.

Prepaid expenses are also current assets. They are expenses of futureperiods that are paid in advance. An example of prepaid expenses is rentwhich may be payable in advance by a firm. For example in January2007, a firm may pay rent for its office for January 2007 to December,2007. If in April, 2007, the financial year of the firm ends, it will regardthe portion of rent paid from May 2007 to December, 2007 as a prepaidexpense which invariably is a current asset.

Stock (inventory) is another current asset and includes raw material,work in process and finished goods. The raw materials and work inprocess are required for maintenance of the production function of thefirm.

Finished goods usually will be already packed and kept ready forpurchase by customers of the business.Marketable securities are the firm’s short term investment in shares,bonds and other securities. The securities are usually marketable and canbe converted into cash in a very short time.

Investments

Investments represent the firm’s investments in shares, debentures andbonds of either firms or the government. By their nature, theinvestments are long term.It is important to note that the investments yield income to the firm.

Fixed Assets

Fixed assets are long-term assets held for periods longer than one year.They are usually held for use in the firm's business. Fixed assets includeland, buildings, machinery and equipment, vehicles, etc.

We have briefly seen what the assets are. We shall now move over anddiscuss liabilities.

3.2.2 Liabilities

When we talk of liabilities, we mean the debts that are payable by thefirm or business to creditors. They may represent various obligationsdue to various third parties arising from various business transactions.

Examples of liabilities include creditors, accounts payable, taxespayable, bonds, debentures, etc.But generally, liabilities are divided into two broad groups namely:

• Current liabilities and

• Long-term liabilities

We shall discuss each of the groups

Current Liabilities

Current Liabilities are those debts that are payable in a shortperiod usually within a year.One of the major current liabilities is the bank overdraft. Most banksgrant their customers overdraft which are repayable within a period ofone year. The other type of current liability includes provisions for taxesand dividends. These are liabilities that will mature within one year.

Another type of liability is expenses payable. The firm mayexpenses to public power supply organisation or have rents to be paid.

Long Term Liabilities

Long-term liabilities are the obligations which are payable in a period oftime greater than a year.One of the long term liabilities of a firm is term loan. The firm mayborrow money from a bank that will be repayable over aperiod preceding one year. Such a borrowing or loan is regarded as long-termliability.Also, when a firm needs to raise a large sum of money, itdebentures. A debenture is an obligation on the part of a firm to payinterest and principal under the terms of the debenture.

However one of the most stable types of long term liability is owners'equity. Owner's equity represents the owners' interest in the firm. Inpractical terms, the total assets of a firm less the liabilities realized on the interest. The owners interest in the firm consist of

• Paid up share capital and

• Retained earnings (undistributed profits).

SELF ASSESSMENT EXERCISE

Discuss the components of a balance sheet.

3.3 Construction of the Projected Balance Sheet

In the earlier sections of this unit, we have discussed the balance sheet generally. That was from a historical perspective. We shall now discussthe construction of a projected balance sheet.

The following steps are recommended:

• Start from the determination of sales revenue.
• Compute cost of goods sold (COGS)
• Compute admin expenses, general and selling expenses.
• Bring forward sundry income and expenses and generate theprojected incomestatement.
• Determine taxation, dividends and retained earnings.
• Project for assets.
• Project for liabilities.

Table 36: A Projected Balance Sheet

Projected Balance Sheet (N)

As at	Year 1
Assets Employed	
Fixed assets	66,629,024
Preliminary expenses	33,140
Total	**66,662,164**
Current Assets	
Stock-in-trade	12,000,000
Raw materials	12,000,000
Debtors and prepayment	1,000,000
Cash and bank balance	2,623,497
Total Current Assets	**27,623,497**
Current Liabilities	
Creditors and accruals	2,000,000
Tax provisions	10,247,185
Total current liabilities	12,247,185
NET CURRENT ASSETS	15,376,312
Total Assets	**82,038,476**

Record leases if any and project for the future amortisations. Bring forward other sundry liabilities, Estimate taxation based on the projected income statement and forecast the future trend. From the net profit estimate amount going to dividends and retained earnings. Record retained earnings. Record paid up capital. Fine tune grey areas. Total the liabilities to agree with total assets.	

4.0 CONCLUSION

We have discussed the projected balance sheet. We first discussed assetsgenerally and then went ahead to discuss liabilities. We discussed theconstruction of the projected balance sheet and provided a checklist forthe projection for both assets and liabilities.

5.0 SUMMARY

We have treated the projected balance sheet. The projected balance sheetas we discussed is a forecast of a future balance sheet as at a future date.It will show what the assets will be and also what the liabilities will be.It is a very important document in project evaluation.

6.0TUTOR-MARKED ASSIGNMENT

1. Who do you think are the users of the information in a projectedbalance sheet?
2. Why do they need the information contained in it?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 4 PROJECT EVALUATION CRITERIA

CONTENTS

1.0 INTRODUCTION

Let us recall that the focus of this course is project evaluation. From unit1, we discussed the project cycle. From there we moved on to discussfactors affecting location of projects. We also discussed capacity andproduction planning, demand analysis, supply analysis, project costanalysis, projected income statements, cash flows and the balance sheet.

All these have set the stage for us to tie the discussions. We now want todiscuss a very crucial aspect of this course, which is the project evaluation criterion. Project evaluation criteria seek to present themethods to be adopted to measure the value of an investment project.The evaluation enables us to choose between two or more projects oncethe values are known.Any project evaluation criterion to be adopted should posses thefollowing characteristics:

- It should provide a means to distinguish between acceptable andunacceptable projects.
- It should also be able to rank projects in order oftheir desirability.
- It should be a criterion that is applicable to any conceivableproject.
- It should recognise that bigger cash flows are preferable tosmaller ones.
- It should recognise that early cash flows or benefits arepreferable to later cash flows or benefits.

Although there are a lot of project evaluation criteria in the literature, weshall discuss the most widely accepted criteria which are the traditionalcriteria and the discounted cash flow (DCF) criteria

2.0 OBJECTIVES

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

- discuss project evaluation criteria
- distinguish between the traditional criteria and the discounted cashflow relative to project evaluation.

3.0 MAIN CONTENT

3.1 Traditional Criteria of Project Evaluation

In the traditional criteria, we shall discuss two methods, namely: thepayback period and the accounting rate of return method.

The Payback Period

The payback period is one of the most popular methods of projectevaluation. The payback period is defined as the number of yearsrequired to recover the original cash outlay invested in a project. If theproject yields constant annual cash inflows, the payback period can becomputed by dividing cash outlay by the annual cash inflow.So we say thus:

Payback period Cash outlay (investment)=Annual Cash inflow

Example

A project requires a cash outlay of N200,000 and yields an annual cashinflow of N50,000 for a period of 10 years; calculate the paybackperiod.

The payback period is N200, 000 = 4 years.

N50, 000

However, it is to be noted that in the case of unequal cash inflows, thepayback period can be computed by adding up the cash inflows until thetotal is equal to the initial cash outlay.The payback period is greatly admired by project evaluators because itis very simple to understand. Another good virtue of the payback periodis that it costs less than most of the other sophisticated methods.

However, despite its simplicity, the payback period may not beadesirable investment criterion. In the first place, it fails to recognise thecash flows that come in after the payback period. Again itfails to consider the pattern of cash inflows and that early cash inflows rather than later cash inflows.

Despite its weakness, the payback period is very popularanalogy. It tries to emphasizes early recovery of an investment. Thismeans that it gives an insight into the cash inflows of the project.

The Accounting Rate of Return (ARR) Method

The accounting rate of return (ARR) is a method that uses accountinginformation to measure the profitability of an investment.The accounting rate of return (ARR) is computed by dividing average income after taxes by the average investment.

ARR Average Income

= Average Investment

Example

A project costs N100,000 and has a scrap value of N40,000. The streamof income before depreciation and taxes are N40,000, N50,000, N60 , 000 for the first three years. The tax rate is 50% and depreciation ison straight line basis.

Calculate the accounting rate of return for the project.

Solution

	Year 1	Year 2	Year 3
	N	N	N
Earnings before depreciation and taxes	40,000	50,000	60,000
Depreciation	20,000	20,000	20,000
Net earnings before taxes	20,000	30,000	40,000
Taxes at 50%	10,000	15,000	20,000
Net earnings after taxes	10,000	15,000	20,000

Book value of investment

Beginning	100,000	80,000	60,000
Ending	80,000	60,000	40,000
Average	90,000	70,000	50,000

$$\text{Average earnings} = \frac{10{,}000+15{,}000+20{,}000}{3}$$

$$= \mathbf{15000}$$

$$\text{Average investment} = \frac{90{,}000 + 70000 + 50{,}000}{3}$$

$$= \mathbf{70000}$$

$$\text{Accounting rate of return} = \frac{15000}{70000}$$

$$= \mathbf{21.42\%}$$

As an accept or reject criterion, the ARR method will accept all thoseprojects whose ARR is greater than the minimum rate established bymanagement. If the ARR is lower than the minimum rate established bymanagement, then the project should be rejected.The ARR method is very simple to understand and use. It can also beeasily calculated using accounting information.

However, the ARR suffers from three main weaknesses. First it usesaccounting profits not cash flows in appraising projects.Secondly ARR ignores the time value of money. The profits occurringin different periods are valued equally.

Thirdly, it does not allow the fact that profit can be reinvested to earnmore profits.

3.2 Discounted Cash Flow (DCF) Methods

We have discussed two of the traditional methods used in the evaluationof projects. One is the payback period while the other is the accountingrate of return (ARR). Although two of them are simple to use andunderstand, they are not theoretically sound. Both of them fail toconsider the timing of cash flows. Both fail to consider the time value ofmoney.

Because of these limitations, we shall consider two superior investmentcriteria which fully recognise the timing of cash flows.

The two methods are the net present value (NPV) method andthe internal rate of return (IRR) method. These two methods are referred toas discounted cash flow (DCF) methods or the tme-adjusted methods.

The Net Present Value (NPV) Method

This method correctly recognises the fact that cash flows arisingdifferent time periods differ in value and are comparable only when theirequivalent- present values are found out.

The following steps are followed when computing the net present value(NPV).

1. A discount rate is selected to discount the cash flows. The correctdiscount rate should be the firm's cost of capital which is theminimum rate of return expected by the investors to be earned bythe firm.
2. The present value of cash inflows and outflows are computedusing cost of capital as the discounting rate.
3. The net present value (NPV) is the present value of cash inflowsless present value of cash outflows.

The acceptance rule using the NPV method is to accept a project if theNPV is positive, and to reject it if the NPV is negative.

If NPV is greater than zero, then the value of the firm is expected toincrease. It is also important for us to understand the interpretation ofNPV. The net present value may be interpreted to mean the immediateincrease in the wealth of a firm if the investment proposal is accepted. Itis equal to an unrealised capital gain. The net present value can also beinterpreted to represent the amount the firm could raise at a required rateof return in addition to the initial cash outlay to distribute immediatelyto its shareholders and by the end of the project life to have paid off allthe capital raised plus interest on it.

Example

Calculate the net present value of a project which cost N500,000. Butgenerates cash inflows of N150,000, N300,000 and N400,000 over athree year period. The required rate of return is 10%.

Solution

Year	Cash inflows	Discount factor at 10%	Present Value of Cash Inflows
	N		N
1	150,000	.909	136,350
2	300,000	.826	247,800
3	400,000	.751	300,400
Total			**684,550**
Less investment outlay			**500,000**
Net present value			**184,550**

In terms of merit, the NPV method is very significant since it recognizes the time value of money. It also is consistent with the objective ofmaximising the wealth of shareholders. However, the NPV suffers fromthe following limitations.

Firstly, it is fairly difficult to use.

Secondly, in computing the NPV, it is assumed that the discount ratewhich usually is a firm's cost of capital is known. But as we know, thecost of capital is a fairly difficult concept to measure in real life.

Thirdly, NPV may not yield a consistent answer when the projects beingcompared involve different amounts of investment.

The Internal Rate of Return (IRR) Method

The internal rate of return (IRR) can be defined as that rate whichequates the present value of cash inflows with the present value of cashoutflows of an investment. Put in another way, the internal rate of returnis the rate at which the NPV of an investment is zero. It is called theinternal rate because it depends solely on the outlay and the resultingcash inflows of the project and not any rate determined outside the

investment.

Let C = Cash outlays of an investment

A1 = Cash inflows received in(I+R). year I discounted atthe cost of capital R.

A2 = cash inflows received in year 2(I+R)2 discounted at the cost ofCapital R.

A3 = cash inflows received in year 3(I+R)3 discounted at the cost ofCapital R.

Write the basic equation

$$C = \frac{A1}{(1+R)} + \frac{A2}{(1+R)^2} + \frac{A3}{(1+R)^3}$$

$$O = C - \frac{A_1}{(1+R)} + \frac{A_2}{(1+R)^2} + \frac{A_3}{(1+R)^3}$$

The value of R in the equation at which total cash outlays equal totalcash inflows is called the internal rate of return (IRR).Usually the value of R can be found out by trial and error. Generally, ifthe calculated present value of the expected cash inflows is lower thanthe present value of cash outflows, a lower rate should be tried. On theother hand, if the calculated present value of the expected cash inflowsis higher than the present value of cash outflows, a higher rate should betried.

Example

A barbers' shop costs N32,400 to establish and is expected to generatecash inflows of N16,000,N14,000 and N12,000 over its life of threeyears. Calculate the internal rate of return.

Solution

Let us start by trying 16%

Year	Cash Inflow	Discount Factor at 16%	Present Value
	N		N
1	16,000	.862	13,792
2	14,000	.743	10,402
3	12,000	.641	7,692

The net present value is –N514 at 16% discount factor. Let us try alower rate like 14%

Year	Cash Inflow	Discount Factor at 14%	Present Value
	N		N
1	16,000	.877	14,032
2	14,000	.769	10,766
3	12,000	.675	8,100

You will observe from the above calculations that when we tried 16%discount rate, the NPV was negative at –N514, when we tried14%discount rate, the NPV became positive at N498. Therefore, theinternal rate of return we are looking for lies between 14% and 16%.

The basic accept-or-reject rule, using the IRR method, is to accept theproject if its internal rate of return is higher than the firm's required rateof return. However, the project should be rejected if its internal rate ofreturn is lower than the firms cost of capital.It is important that we understand the interpretation of the internal rateof return (IRR).

The internal rate of return (IRR) represents the highest rate of interest afirm would be ready to pay on funds borrowed to finance the projectwithout being financially worse-off, by repaying the loan principal plusaccrued interest out of the cash inflows generated by the project.

We should also see the internal rate of return method as a very soundmethod. As we said, it is a discounted cash flow method and also itconsiders the time value of money. It is also compatible with the firm'sdesire to maximise the owners' wealth. However the IRR method isfairly difficult to understand and it involves complex computations.

SELF ASSESSMENT EXERCISE

Distinguish between the traditional project evaluation methods and thediscounted cash. Show criteria.

4.0 CONCLUSION

We have discussed project evaluation criteria which we said constitute avery crucial topic in this course. We discussed traditional criteria ofproject evaluation. Here we mentioned the payback period andthe accounting rate of return (ARR). We also discussed discounted cash inflow criteria. Here we mentioned the net present value (NPV) methodand the Internal Rate of Return (IRR).

5.0 SUMMARY

Project evaluation criteria provide us with the tools with which we canchoose from various investment proposals using acceptable techniques.The evaluation criteria guide the project initiator and assist him/her tochoose among alternative projects. Also banks use project evaluationcriteria to decide whether or not to lend money for a project.

6.0 TUTOR-MARKED ASSIGNMENT

Why are the discounted cash flow (DCF) techniques better and moreacceptable than the traditional methods of project evaluation?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 5 INTRODUCTION TO ECONOMIC ANALYSIS

CONTENTS

1.0 INTRODUCTION

Generally, in a project analysis situation, most analyses focus on thecash inflows and outflows of a project. Critical expenses and incomesare usually compared to determine whether a project should beundertaken or not. But expenses and revenues in most financial analysesare mainly the consideration of a private investor.

The implication of financial analysis is that it provides a micro view of aproject and concentrates attention on things like accounting profits.

Economic analysis on the other hand considers projects from a macropoint of view. The type of questions asked in an economic analysis are:

1. Will the project under consideration lead to the general wellbeing of the community, the state and the nation?
2. Will the project generate employment at various levels in themacro environment?
3. Will the project lead to economic growth?
4. What are the linkages that the project has, i.e., forward orbackward linkages?
5. Will the project generate more technical knowledge?

The questions that we have asked are not exhaustive but only go todemonstrate the type of questions that economic analyses seek toanswer.

2.0 OBJECTIVES

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

- explain the meaning of an economic analysis
- distinguish between an economic analysis and a financial analysis.

3.0 MAIN CONTENT

3.1 Financial Analysis and Economic Analysis – aComparison

In general theory, a financial analysis tries to solve resource allocationproblems. It tries to use information from projects to determine whetherprojects should come on stream or not.Economic analysis also tries to solve resource allocation problems in aneconomy. In economic theory,

resources are very scarce and it is part ofany good analysis to allocate resources between competing projects. Forexample, resource allocation problems can arise if a community is tryingto decide whether to build a school or a hospital with limited scareresources.

Financial analysis equally tries to allocate resources but from a microview point. So, both financial and economic analyses solve resourceallocation problems.

Financial analysis tries to concern itself with issues of both benefits andcosts arising from a project. In the financial analysis, the concern of theanalysis is to evaluate the stream of costs attached to a projectand deduct same from the stream of benefits.

If the stream of benefits is greater than the stream of costs, then project in question has a positive value and should be accepted,allthings being equal. However, if the stream of costs is greater than thestream of benefits, then the project in question has a negative value andshould not be accepted, all things being equal.

Economic analysis also concerns itself with costs and benefits arisingfrom a project. If the stream of benefits is greater than the stream ofcosts, then the project in question has a positive value and should beaccepted.

However, if the stream of costs is greater than the stream of benefits,then the project in question has a negative value and shouldnot be accepted , all things being equal.So we could say that financial analysis and economic analysis bothconcern themselves with costs and benefits arising from a project. In theend, they provide answers to the question of whether a project should beacceptable or not. In evaluating projects, both use discounting andcompounding techniques to arrive at their answers.

However, there exist conceptual differences between financial analysisand economic analysis. While financial analysis has a primary objectiveof establishing the viability and acceptability of a project from afinancial view point, paying no attention to society, economic analysishas the objective of establishing the fact that a project is acceptable ornot to the society as a whole. So while financial analysis has a microobjective, economic analysis has a macro objective.

Finally, in reaching a decision as to whether or not to accept a project,financial analysis and economic analysis both try to establish arelationship between costs and benefits.

For example in financial analysis, costs and benefits arising from aproject are usually defined in monetary variables such as profits. Buteconomic analysis goes really beyond the vague definitions of profit. InEconomic analysis, costs are defined in terms of opportunity costs orforegone costs to the society as a whole.

SELF ASSESSMENT EXERCISE 1

Compare and contrast financial analysis and economic analysis.

3.2 The Nature of Economic Analysis

In economic analysis, the costs and benefits attached to a project areusually compared before a decision can be reached on whether or not toaccept a project.

In the literature, there exist three discounted measures of project worthwhich we will now discuss:

The Net Present Worth

The net present worth is the difference between the present worth ofbenefits and the present worth of costs. We can write thus:

Net Present Worth = | Present Worth of benefits | | Present Worth of costs |

Generally, according to the net present worth theory, a projectis acceptable if the net present worth is positive. If the net present worth isnegative, the project will be rejected.

Benefit-Cost Ratio

If you divide the present worth of benefits of a project by the presentworth of its costs, then you have what is known as the benefit-cost ratio.We can write thus:

Benefit-Cost ratio = Present worth of benefits

Present worth of costs

Generally, a project is acceptable if the benefit-cost ratio is greater than1 (one).

If the benefit-cost ratio is exactly 1 (one), that project is abreak even project.

The Internal Rate of Return (IRR)

The internal rate of return is a discount rate where the present worth ofbenefits is equal to the present worth of costs.

Under the internal rate of return evaluation method, a project will beacceptable if its internal rate of return is higher than the firm's requiredrate of return.

The starting point of economic analysis is the financial analysisof a project which should be properly concluded before embarking on aneconomic analysis. Some adjustments will be made to the calculations to arrive at economic data.

First, it may be necessary to include or exclude some costs and benefitswhich may have been included or excluded from the financial analysis.

Secondly, some project inputs and outputs may have to be revalued iftheir shadow prices differ significantly from their market prices.

SELF ASSESSMENT EXERCISE 2

Discuss the nature of economic analysis with emphasis on the methodsof evaluating the worth of a project.

3.3 Adjustments to Financial Analyses

We have stated that the starting point of an economic analysis is afinancial analysis, so if we have financial data on financial analysis, weneed to make some adjustments to the financial analysis to arrive ateconomic analysis data. We shall now consider some of the adjustments:

Transfer Payments

Transfer payments represent transfer of resources from one section ofsociety to another. They do not make any claim on the country'sresources and as such, their impact should be clearly distinguished andanalysed in the economic analysis.

One of the first transfer payments we shall consider is interest. Interestis a reward for capital. For example, if a project is funded through abank loan, the interest component is included in the profit and lossstatement.

The interest charges in the profit and loss statement represent transferpayments from a project to the provider of funds. What the project lost(interest) has become a gain to the provider of funds.

In effect, both figures are equal and cancel out without any net increaseto society of funds. Therefore in economic analysis, interest charges areexcluded since they only represent transfer payments.

The second transfer payment we shall consider is tax. When a project isprofitable it is expected to pay taxes to the government at the ruling rate.In computing the profit of a project taxes are deducted to arrive at netprofit. Taxes therefore appear as outgoing cash flows. Taxes representtransfer payments from a project to government.

In the economic analysis of a project, taxes are excluded because fromthe point of view of the society, they are only a transfer of resourcesfrom one section of the economy to another.

The third transfer payment is subsidies. In a traditional private sectors setting, it would be unheard of to talk of subsidies. But in economicanalysis, subsidies appear as important data. Most public sector projectsenjoy government subsidies to enable the poor gain access to certainservices which ordinarily they cannot afford without governmentassistance. Subsidies represent opportunity costs to a nation as a whole.

Therefore in estimating the true cost of a project in an economicanalysis, subsidies should be included.

3.4 Linkage Effects of a Project

Consider a simple case where a university is newly located inan environment. Many investments will begin to spring up. New housingdevelopments will begin to spring up; canteens will begin to spring up;hair dressing salons, etc. will begin to spring up to cater for the needs ofthe new university community. Such constitute the linkage effects of aproject.

Generally, there are two types of linkage effects which we shall brieflydiscuss:

Forward Linkage Effects

Forward linkage is the stimulus given to industries that use the productsof a project. A case in point is a flour manufacturing project. Flour hasso many uses. If a flour mill is located in an environment, it will lead tothe establishment of such projects as bakeries which will use the flour.

Backward Linkage Effects

Backward linkage demonstrates the stimulus to industries that supplythe inputs to a project. For example, the establishment of a flour mill inan environment will lead to demand for wheat which is a major input forflour mill. The flour mill will lead to investment in wheat cultivation.

Also, the establishment of a car assembly plant will lead tothe establishment of tyre manufacturing plants that need to supply tyres tothe car assembly plant.

Example of an Economic Analysis

In the year 2006, the World Bank was considering the desirability orotherwise of assisting Nigeria set up an ethanol plant covering thousandsof hectares in the Niger Delta area.

Under the scheme, young farmers will be allocated hectares of land forsubsidized cassava cultivation. Such inputs like fertilizers will be heavilysubsidized while technical advice will be provided by the World Bank/Nigerian agricultural experts.

4.0 CONCLUSION

In this unit, we discussed the nature of economic analysis and comparedit with the financial analysis of a project. We discussed netpresent benefit cost ratio and the internal rate of return (IRR).

5.0 SUMMARY

Introduction to economic analysis has provided us with the tools toconduct economic analyses, with financial analyses as a starting point.

Financial analysis is the private sector's view of a project withoutconsidering a project's impact on the society. Economic analysis is amacro view of a project, taking into consideration the project's impacton society.

6.0 TUTOR-MARKED ASSIGNMENT

What do you see as the basic differences between the financial analysisof a project and the economic analysis of a project?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: ImpressedPublishers.

UNIT 6:CASHFLOW DIMENSIONS

CONTENTS

1.0 INTRODUCTION

In this unit, we will discuss cashflow dimensions. The section firstly establishes the meaning of cashflow and its benefits and thereafter the dimensions of cash flow. Cash is mainly generated for operating activities which is buying assets and discharging liabilities. Cash is also raised fromthe issue of shares and debentures or loans but adequate cash should beavailable for use in time and no cash should remain idle. For this, a tool of analysis is used which is referred to as the cash flow statement.

2.0 OBJECTIVES

In this lesson, you will learn about:

meaning of cashflow and its benefits.

dimensions of cashflows and its methods of preparation.

Cashflow statement

3.0 MAIN CONTENT

3.1 Meaning of Cash Flow

The summary of cash transactions (receipts and payments) during an accounting period is called Cash Flow Statement. Cash flows are inflows (i.e. receipts) and outflows (i.e. payments) of cash and cash equivalents. *Cash inflows* represent benefits and *cash outflows* represent costs. The difference between the two at any point in time is called *net cash flows*.Cashflowcomprises of cash on hand and demand deposits.Movement in cash and cash equivalents are not cash flows.

3.2 Cash and Cash Equivalents

Cash: Cash comprises of cash in hand and deposits repayable on demand with any bank or other financial institution.***Cash Equivalents:*** cash equivalents are short term, highly liquid investments that are readily convertible into known amounts of cash and are subject to insignificant risk/change to value. They are not held for investment or other long term purposes, but rather to meet short-term cash commitments. To fulfil the above definition, an investment's maturity date should normally be within three months from its acquisition date. It would usually be the case then that equity investments (i.e. shares in other companies) are not cash equivalents.

3.3 Benefits of cash flow information

Benefits here explain the advantages or helps from cashflow and cashflow information. The use of statements of cash flows is very much in conjunction with the rest of the financial statements. Some benefits to be derived from cashflow and cashflow information are:

a. Cash flow information of a historical nature can be used as an indicator of the amount, timing and certainty of future cash flows.
b. Statements of cash flows enhance comparability as they are not affected by differing accounting policies used for the same type of transactions or events
c. Users can gain further appreciation of the change in net assets, entity's financial position (liquidity and solvency) and entity's ability to adapt to changing circumstances by affecting the amount and timing of cash flows.
d. Past forecast cash flow information can be checked for accuracy as actual figures emerge. The relationship between profit and cash flows can be analyzed as a result of changes in prices over time.

3.4 Dimensions of Cashflow

The dimensions of cashflow mean the various aspects of cashflows arising from activities in the organization. The dimensions of the cashflow are in different forms. The cashflows generated through various activities in the organization are classified as:

1. Operating cashflow.
2. Investing cashflow.
3. Financing cashflow.

The remaining part of this section will discuss each of this in detail with illustrations where necessary.

1. Operating Activities

Operating activities are principal revenue producing activities of the enterprise.It is perhaps the key part of the statement of cash flows because it shows whether, and to what extent, companies can generate cash from their operations. It is these operating cash flows which must, in the end pay for all cash outflows relating to other activities, i.e. paying loan interest, dividends and so on. Most of the components of cashflows from operating activities will be those items which determine the net profit or loss of the entity, i.e. they relate to the main revenue-producing activities of the entity. Other activities that are not investing or financing activities are also referred to as operating activities.

Examples are:

- Cash receipts from sale of goods or rendering services.
- Cash receipts from royalties, fees, commissions and other revenue.
- Cash payments to suppliers of goods and service.
- Cash payments to and on behalf of employees.

Reporting of Cashflow from operating activities

Cashflow from operating activities can be reported in two forms. It can be derived either from direct method or indirect method.

Direct method

In this method, gross receipts and gross payments of cash are disclosed.

Cash receipts from customers	XX
Cash paid to suppliers	XX
Cash paid to employees	XX
Cash paid for other operating expenses	XX
Cash generated from operation	*XX*
Income tax paid	XX
Net cash from operating activities	**XX**

Indirect method:

In this method, profit and loss account is adjusted for the effects of transaction of noncash and non-operating nature.Cash flows from operating activities are identified by adjusting the profit before tax figure. It arrives at the cash from operating activities figure indirectly by reconciling a profit figure to a cash figure. The adjustments remove the impact of accruals and non-cash items and also relocate somefigures to other positions in the statement of cash flows.Cash flow statement of listed companies shall be presented only under the indirect method as prescribed below.

Retained Earnings	XX
Add: Dividend paid	XX
Income Tax	XX
Net Profit before Tax	XX
Add: Depreciation	XX
Loss on sale of Asset/Investment	XX
Interest Paid	XX
Provision for Bad debts	XX
Less: Interest/ Dividend Received	XX
Profit on sale of Asset/ Investment	XX
Funds from operations	**XX**
Add: Decrease in Current Asset	XX
Add: Increase in Current Liabilities	XX
Less: Increase in Current Asset	XX
Less: Decrease in Current Liabilities	XX
Cash generated from operation	XX
Income Tax Paid	XX
Net Cash flow from operating activities	**XX**

Example 1: The following information has been extracted from the financial statements of Hopper Company for the year ended 31 December 2014.

	₦
Sales	1,280,000
Cost of sales	(400,000)
Gross profit	880,000
Wages and salaries	(290,000)
Other expenses (including depreciation ₦25,000)	(350,000)

	240,000
Interest charges	(50,000)
Profit before tax	190,000
Tax on profit	(40,000)
Profit after tax	150,000

Extracts from the statement of financial position:

	At 1 Jan. 2013	At 31 Dec.2013
	₦	₦
Trade receivables	233,000	219,000
Inventory	118,000	124,000
Trade payables	102,000	125,000
Accrued wages and salaries	8,000	5,000
Accrued interest charges	30,000	45,000
Tax payable	52,000	43,000

Required: Present the cash flows from operating activities as they would be presented in a statement of cash flows using:

a) the direct method; and

b) the indirect method.

Answer:Direct method

Statement of cash flows: direct method	₦
Cash flows from operating activities	
Cash receipts from customers(W1)	1,294,000
Cash payments to suppliers(W3)	(383,000)
Cash payments to employees(W4)	(293,000)
Cash paid for other operating expenses	(325,000)
Cash generated from operations	293,000
Taxation paid (tax on profits)(W5)	(49,000)
Interest charges paid(W5)	(35,000)
Net cash flow from operating activities	209,000

Workings:

(W1) Cash from sales	₦
Trade receivables at 1 January 2013	233,000
Sales in the year	1,280,000
	1,513,000
Trade receivables at 31 December 2013	(219,000)
Cash from sales during the year	1,294,000

(W2) Purchases	₦
Closing inventory at 31 December 2013	124,000
Cost of sales	400,000
	524,000
Opening inventory at 1 January 2013	(118,000)
Purchases in the year	406,000

(W3) Cash paid for materials supplies	₦
Trade payables at 1 January 2013	102,000
Purchases in the year (W2)	406,000
	508,000
Trade payables at 31 December 2013	(125,000)
Cash paid for materials	383,000

Financial reporting

(W4) Cash paid for wages and salaries	₦
Accrued wages and salaries at 1 January 2013	8,000
Wages and salaries expenses in the year	290,000
	298,000
Accrued wages and salaries at 31 December 2013	(5,000)
Cash paid for wages and salaries	293,000

(W5) Interest and tax payments	Tax	Interest
	₦	₦
Liability at the beginning of the year	52,000	30,000
Taxation charge/interest charge for the year	40,000	50,000
	92,000	80,000
Liability at the end of the year	(43,000)	(45,000)
Tax paid/interest paid during the year	49,000	35,000

Answer: Indirect method

Statement of cash flows: indirect method	₦
Cash flows from operating activities	
Profit before taxation	190,000
Adjustments for:	
Depreciation and amortization charges	25,000
Interest charges in the statement of comprehensive income	50,000
	265,000
Decrease in receivables (233,000 – 219,000)	14,000
Increase in inventories (124,000 – 118,000)	(6,000)
Increase in trade payables	
(125,000 + 5,000) – (102,000 + 8,000)	20,000
Cash generated from operations	293,000
Taxation paid	(49,000)
Interest charges paid	(35,000)

Net cash flow from operating activities 209,000

2. Investing Activities

The activities of acquisition and disposal of long term assets and other investments not included in cash equivalent are investing activities.This is the second part of a statement of cash flows, after cash flows from operating activities.The cash flows classified under this heading show the extent of new investment in *assets which will generate future profit and cash flows*.It includes acquiring and disposal of debt and equity instruments, property and fixed assets etc.The most important items in this part of the statement are cash paid to purchase non-current assets and cash received from the sale or disposal of non-current assets but it also includes interest received and dividends received on investments.

Examples:

- Cash payments for purchase of fixed assets.
- Cash receipts from disposal of fixed assets.
- Cash payments to purchase shares, or debt instruments of other companies.
- Cash receipt from disposal of above investments.

3. Financing Activities

Financial activities are those activities that result in changes in size and composition of owner's capital and borrowing of the organization.This section of the statement of cash flows shows the share of cash which the entity's capital providers have claimed during the period. This is an indicator of *likely future interest and dividend payments.*It includes receipts from issuing shares, debentures, bonds, borrowing and payment of borrowed amount, loan etc.

Example:

- Issue of equity shares.
- Buy back of equity shares.
- Issue/ redemption of preference shares.
- Issue / redemption of debentures.
- Long term loan / payment thereof.
- Dividend / interest paid.

Payments of dividends are also usually included within cash flows from financing activities, in this part of the statement of cash flows. (Some entities may also include interest payments in this section, instead of including them in the section for cash flows from operating activities.

3.5 Treatment of other Items in the Cashflow Statements

Interest: Interest received on investment is treated as investment inflow. Interest received from short term investment is classified as cash equivalents and should be considered as cash inflows from operating activities. Then interest received on trade advances, operating receivables and financial enterprises should be in operating inflows. On the other hand, interest paid on loans/debts is financing activities. And on working capital loan or loan taken to finance operating activities are included in operating inflows. Then for financial enterprises is in operating outflow.

Dividend: Dividend received for non-financial enterprises is an investing inflow. While dividend received for financial enterprises is an operating inflow.On the other hand, dividend paid is always classified as financing inflow.

*Foreign currency transactions:*The effect of change in exchange rate in cash and cash equivalents held in foreign currency should be reported as separate part of the reconciliation of

cash and cash equivalents. Unrealized gain and losses arising from changes in foreign exchanges rates are not cash flows.

*Extraordinary items:*The cash flows associated with extraordinary items should be classified as arising from Operating, Investing or Financing activities as appropriate and separately disclosed. For example: insurance claim received against loss of stock or profits is extraordinary operating cash inflow; insurance claim received against loss of fixed assets is extraordinary investing cash inflow.

*Treatment of tax:*Cash flow for tax payments / refund should be classified as cash flow from operating activities.Taxes deducted at source against income are operating cash outflows if concerned income are operating.Cash flow for tax payments identified with a specific investing or financing flow should be classified as investing or financing flow respectively. For exampledividend tax is recognized as financing flow.

*Acquisitions and disposals of subsidiaries/other businesses:*Cash flow on acquisition and disposal of subsidiaries and other business units should be presented separately and classified as investing activities.Total purchase and disposal should be disclosed separately. Also the position of the purchase / disposal consideration discharged by means of cash and cashequivalents should be disclosed separately.

*Non-cash transactions:*These should be excluded from the cash flow statement.Rather, these transactions should be disclosed in the financial statements.Examples are acquisition of assets by assuming directly related liabilities; acquisition of an enterprise by means of issue of equity shares; conversion of debt to equity etc.

Disclosures of cash and cash equivalents: The components of cash and cash equivalents should be disclosed.Reconciliation of the amount in the cash flow statement with the equivalent items reported in the balance sheet.

4.0 CONCLUSION

We conclude that cash flows are inflows (i.e. receipts) and outflows (i.e. payments) of cash and cash equivalents in the organization.The dimensions of the cashflow are generated from various cash related activities in the organization. They are operating cashflow, investing cashflow and financing cashflow.

5.0 SUMMARY

In this unit the meaning of cashflow was stated along with cash and cash equivalent. Then the benefits of cashflow listed. The dimensions of Cashflow arising from cash related activities in the organization are operating cashflow, investing cashflow and financing cashflow. The main content of the unit ended with the treatment of other Items – interest, tax, non-cash transaction, dividend etc in cashflow statement.

6.0 TUTOR-MARKED ASSIGNMENTS

6. What is the meaning of cashflow?
7. Explain with example the operating cashflow dimension.

7.0 REFERENCES/FURTHER READINGS

Mason, R. (2012), *Finance for Non Financial Managers.* Holder & McGraw Hill Companies.

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Financial Reporting: ICAN Study Text: Nigeria, Emily Woof International 2014

MODULE 4 RISK AND COST ANALYSIS

UNIT 1 THE EVALUATION METHODS

CONTENTS

2.0 OBJECTIVES

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

- explain the meaning of Evaluation
- analyse the purpose of evaluation and classify difference types of project evaluation.

3.0 Introduction

The evaluation of on-going and completed projects is one of the basic responsibilities of the Planning and Development Division.

3.1 Purpose of Evaluation

The final phase in the project cycle is project evaluation. The analyst looks systematically at the elements of success and failure in the project experience to learn how to plan better for the future. The basic objective of such a study is to ascertain the real worth of a project or programme as far as possible. Broadly speaking, evaluation may be defined as "a process which attempts to determine as systematically and objectively as possible the relevance, effectiveness and impact of activities in the light of the objectives". It is, thus, a critical analysis of the factual achievements/results of a project,

programme or policy vis-a-vis the intended objectives, underlying assumptions, strategy and resource commitment. In specific terms, it makes an attempt to assess objectively the following:-

(a) the relevance and validity of the objectives and design of the project/programme in terms of broader issues of development policy, sector/sub-sector priorities and strategies as well as other problems of a wider nature;
(b) the efficiency and adequacy of the pace of progress of the project/programme where the focus is mainly on managerial performance and productivity;
(c) the effectiveness of the project/programme - a major part of an evaluation exercise-in realizing the intended objectives from a variety of angles; and
(d) the identification of reasons for the satisfactory or unsatisfactory accomplishment of the results of the project/programme and to deduce critical issues and lessons which may be of relevance to other on-going and future projects/programmes of a similar nature.

3.1.3 Types of Evaluation

Evaluation can be applied for different purposes as well as to a specific activity, project or programme. It is not restricted to the completion stage only but involves periodic investigations at many stages. The different types of project evaluations carried out are: (i) ex-ante evaluation, (ii) on-going evaluation and (iii) terminal evaluation/ex-post evaluation. The ex-ante evaluation/pre-approval appraisal has already been discussed with methods and techniques in Chapter-5. The on-going evaluation is carried out by the organization of its own to re-assess the projected feasibility of the PC-I content because of the time lag, while external evaluation is done by an agency other than the body involved in the implementation of a project. On-going and post-completion evaluations are discussed below:-

(a) On-going/Mid-term Evaluation

The main purpose of an on-going/mid-project evaluation is to assist the project management to make appropriate adjustments in the changed circumstances or to rectify any shortcomings in the original design, so as to improve its efficiency and overall performance.

(b) Post-Completion Evaluation

The purpose of an ex-post or post-hoc evaluation is to discover the actual, as opposed to the projected, results of implementing a project. The aim of evaluation is primarily to compare the actual outcome of the project with the projections made at the appraisal stage. The examination of different aspects of the project can provide important lessons derived from experience for the new projects. The overall impact of the project will result in a number of effects which can be classified as costs and benefits, direct and indirect or tangible and intangible. Ex-post evaluation takes place

after the completion of the project and is often more in-depth as it focuses on the analysis of impact. Besides, it is time-consuming, costly and calls for persons with special skills.

SELF ASSESSMENT EXERCISE 2
Discuss the nature of evaluation of a project.

4.0 CONCLUSION

In this unit, we discussed the nature of economic analysis and compared it with the financial analysis of a project. We discussed net present benefit cost ratio and the internal rate of return (IRR).

5.0 SUMMARY

Introduction to meaning of evaluation, the purpose of evaluation and types of evaluation.society.

6.0 TUTOR-MARKED ASSIGNMENT

Write short note on midterm evaluation and post-completion evaluation?

7.0 REFERENCES/FURTHER READINGS

Leon Ikpe (1999). Project Analysis and Evaluation. Lagos: Impressed Publishers.

UNIT 2 CONCEPT OF RISK IN AN ORGANIZATION

CONTENTS

1.0 INTRODUCTION

Risk is part of everyday life. Consequently everyone has his own viewas to what risk is all about, most especially based on his own personalexperiences.

Risk could range from near accident misses to catastrophic events suchas the terrorist attack of the World Trade Center in United States ofAmerica in September 11th 2001 or the Ikeja Bomb blast of January2002.

In the same vein, different people have different level of tolerance ofrisk. This is why the study of risk-either on individual or corporate levelis very vital.

2.0 OBJECTIVES

After studying this unit, you should be able to:

- Explain the potential risk to mankind.

- Differentiate between speculative risk and operational risk.
- Describe the relevance of risk management within corporatestrategies.
- Explain the regulatory and advisory pressures on management.
- Explain the fundamental steps in the process of risk management.
- Describe the role and position of the risk manager within anorganization.

3.0 MAIN CONTENT

3.1 Meaning of Risk

Risk has been described as a natural ingredient to any activity. Noventure, no success; this could be recorded as no risk, no success eitherfor an individual or organization.

The question now is what do we mean by risks?

To answer this question, there is need for us to note that differentauthors have defined risk in various ways. Williams Jr. and Heins(1985) had posited that, no one definition is "correct". That is, thedefinition could be likened to the story of the seven blind men'sdescription of the elephant – all of which are correct and at the sametime incorrect. The above might not be unconnected to the fact that risksexist whenever the future is unknown. More so, that the adverse effectsof risk had challenged the survival of mankind on planet earth ever sincetime immemorial.

In this regard, we will like to look at the different views of some of thereputable authorities on the subject, as stated below.

1. "The term risk has a variety of meaning in business and everydaylife. At its most general level, risk is used to describe anysituation where there is uncertainty about what outcome willoccur. Life is obviously very risky, even the short-term future isoften highly uncertain. In probability and statistics, financialmanagement, and investment management, risk is often used in amore specific sense to indicate possible variability in outcomesaround some expected value – Harrington, Nichaus (1999,p3)

2. Risk will be looked at from the viewpoint of whether an incidentis likely to occur. It is also necessary to consider how often suchan incident could happen and how damaging the incident wouldbe if and when it occurred. - David Kaye (2001, p1/2)

3. RISK is the variation in the outcomes that could occur over aspecified period in a given situation. If only one outcome ispossible, the variation and hence the risk is O. If many outcomesare possible, the risk is not O.The greater the variation, thegreater the risk. - Williams, Jr and Heins (1985, P6).

4. Risk, defined as uncertainty as to loss poses a problem toindividuals in nearly every walk of life. Students,householders, business people, employees, travelers' investors,and farmers all must face risk and develop ways to handle it. Ifa cost or loss is certain to occur, it may be planned for in advanceand treated as a definite, known expense. It is when there isuncertainty about the occurrence of a loss that risk becomesimportant problem. Greene andTriechman (1984, 3).The essence of the above descriptions is to assist usappreciate theimportance of risk to our everyday existence. These descriptions beensummed up in nutshells in the definitions below:

i Risk is variation in possible outcomes of an event based onchance. – orfman's Introduction to Risk Management &Insurance, 4th Edition.

ii Risk is uncertainty as to loss.– Greene &Trieschmann's, Risk & Insurance, 7th Edition.
iii Risk equals uncertainty. Risk has principally to do with theuncertainty of a loss.
– Mehr&Cammack's Principle of Insurance 3rd Edition.
iv Risk may be defined as the possibility that loss will be greaterthan is normal, expected, or usual.– Mehr&Hedges's Risks Management Concept &Application.
At this point, it is important to note that there are those who enjoy anduse risk as well as those that are risk averse – they avoid risks! Inbetween the two extremes that majority of people can be located.

3.2 Types of Risk

For the purpose of this course, we look at risk from these two types.That is, the speculative risk and operational risk.

Speculative Risk

These are risks where the outcomes could either be a loss, no loss orprofit. For instance, if a company decides to invest its money in aproject, the objective of using fund in the way is to make profit. But inreality, the outcome could either be a loss, a break-even or a profit.
Risks with such tendencies are classified as speculative risks. Examplesof speculative risks are:

- Decision as to invest in a new project, the timing of such aninvestment
- Whether to enter a new market place or a new country (as in thedeveloped countries' emerging market concept of Asia, etc.)
- A car maker deciding to replace a current model, the timing and levelof investment needed, etc.

Operational Risk

These are risks that any organization faces in carrying out its dailyactivities. This occurs when something unplanned and unpleasant hit theorganization causing losses – either to men or materials – in theorganization. In an operational risk, the outcome is either a loss or noloss situation. Some textbooks refer to this type of risk as Pure Risks.
As a result of the unexpected nature of this kind of risks, organizationscan prepare for losses following the occurrence of such risks, throughinsurance, contingency planning and other funding mechanisms. Thereis always thechallenge to organization to recognize and manage theoperational risks threatening their existence.

SELF ASSESSMENT EXERCISE 1

Differentiate between speculative risk and operational risk.

3.3 Relationship Between Risk and the Objectives of anOrganization

The objective of an organization is to maximize its profit. This mainobjective has always been made difficult as a result of the impact of riskto the organization. For instance, if an organization suffers from anindustrial accident which, let say, makes it pay out the sum of N50Million in form of various compensation to the victims of such losses.
You will note that this will affect the overall result of the organization atthe end of its financial year.Apart from the objective of profit maximization, a modern organizationhas alongside other

objectives. The objective of an organization may beinformal while at times, they are formal and documented in form ofstrategic plan.

These objectives are shared with the organization's 'stakeholders'.The 'stakeholders' have been defined by Kaye (2001) as people ororganization, which could be affected by a risk incident occurring in theorganization itself. As, he sees risk as having the potential to "threaten the operations, assets and other responsibilities of an organization". Theidentified 'stakeholders' by Kaye (2001) are:

1. Employees.

- Morale and pride. This often reflects the degree of the employees'interest in the success of an organization and has a direct link into thequality of work performed.
- A need for a job to sustain personal and family life and also selfesteem.
- A safe working environment

2. Suppliers

- Suppliers to the organization will depend on its survival to be able todeliver and receive payment for the goods or services contracted.
- Sometimes the loss of one or more large customers can destroy asupplier of goods and services.
- The organization, as supplier, can destroy customers who are furtherup the delivery chain.

3. Customers and Other Recipients of Service

- Most business customers are free to move to other organizations.They will do so if they lose confidence in either delivery or quality.
- Other, non-commercial, service suppliers may find that theirrelationships with their existing recipients will become difficult andeven fail should confidence be lost.
- Sales teams will find it increasingly difficult to find new customers.
- Failure to deliver the contracted services with sufficient quality canlead to litigation for damages well beyond the value of the item indispute.

4. Distributors

- Distributors are in effect wholesale customers. All the commentsabout customers therefore apply.
- Some distributors depend on few or even one source of supply (e.g. adistributor of a new motor vehicles). Failure of that one source ofsupply could damage that distributor on many different ways. It caneven cause it to fail if an adequate replacement supplier is not foundsoon enough.

5. Regulators

- There are various regulators who, in many different ways, will take acontinuing interest in the origination.
- Failure to satisfy the statutory and other requirement of theseregulators can result in them imposing fines, restricting business orclosing down the business altogether.
- The losses therefore can range from financial, reputational damageand even closure.

6. The Media

- The media has many firms:
- Local and international Newspapers
- Television and Radio
- Popular and Professional Magazines
- Increasingly, the Internet.
- These can be regarded as wholesale distributors of the reputation ofan organization and its officials.
- If a publication is negative about an organization much damage canbe done. This is so whether the story reflects the truth, only part ofthe truth, or even is factually incorrect.
- The impact therefore is of significance to all other stakeholders.

7. Private Investors

- Private, monetary, investors can range from family, partners,employees, associated companies and other investors in anorganization often they can be exposed to devastating loss than stockmarket investors who have more opportunity to spread theirinvestments, and therefore the risk across different companies andmarket.
- There are also 'investors' who have a non-monetary stake in theorganization. They stake their professional and personal reputationsalongside that of the organization. They too can suffer loss alongsideany damage to the organization itself. They can find it a very longand difficult process to rebuild this type of asset.

8. Banking Industry

- Banking and investor finance companies will maintain, throughout,an interest in the fortunes of those organizations to which they haveprovided money.
- If that money is perceived to be at greater risk due to an unexpecteddownturn in the strength of an organization, the cost of borrowingcan increase significantly.
- If the financier believes there is sufficient cause for concern, theassets that are the security for that loan can be sold. The lender canhave that power under the terms of the loan or mortgage agreement.Primarily the decision when to sell the mortgage assets will be basedon the interests of the financier and not necessarily the longer-terminterests of the organization and its other stakeholder.

9. Quoted Shareholders

- Quoted shareholders come to the organization through stock marketsin various forms.
- Usually the investor has many choices beyond the subjectorganization and can switch funds away rapidly.
- Stock market sentiments however have many other influences(beyond the success of the individual quoted organization) and thusits behaviour becomes a risk in itself.
- Failing stock values can also increase the cost of borrowing capital.If leaders perceive that the relationship between total borrowings andthe value of the company is narrowing they can demand higherinterest rates and security.

- Single points of influence can affect shares widely. These influencesinclude credit rating agencies such s Standard and Poor's, andinvestment analysts employed by the bigger brokers and merchantbankers.

10. The Environment

- Increasingly, there is public and statutory interest in the quality ofthe environment.
- It is a very wide subject not only covering pollution of the physicalenvironment. Organizations may need to consider money launderingand insider dealing through to corporate manslaughter and otherpotential criminal acts.

And Others

- Individual organizations may have their own, different stakeholderpressure. One example would be a political organization with owndependencies to protect.
- Competitors too are a form of 'stakeholders'. If an organization isweakened by an unexpected damaging incident, there is usually awhole range of competitors who will see the incident as anopportunity for themselves.

SELF ASSESSMENT EXERCISE 2

Identify and explain organization's stakeholders

3.4 Organization Risk Exposure

The organization is exposed to risk, which could affect its people, itsassets and / or other people as well as their assets.

People

The people are usually exposed to the risks of injury, sickness or deathdepending on the nature of activities carried out in the organization. Forinstance, for an employee of an asbestos manufacturing company, apartfrom the risk of injury, he or she could be exposed to asbestos relatedsickness such as lung cancer, etc.The people exposed to organization's risk are:

- Employees
- Visitors / Customers
- Third parties

Assets

The assets of the organization are also exposed to the risk of damage.Such assets are:

- Balance Sheet assets – such as money, building, equipment, vehiclesetc.
- Off balance sheet assets – such as intellectual assets
- (Information and knowledge) reputation network of critical,suppliers, distribution system, customer base, etc.

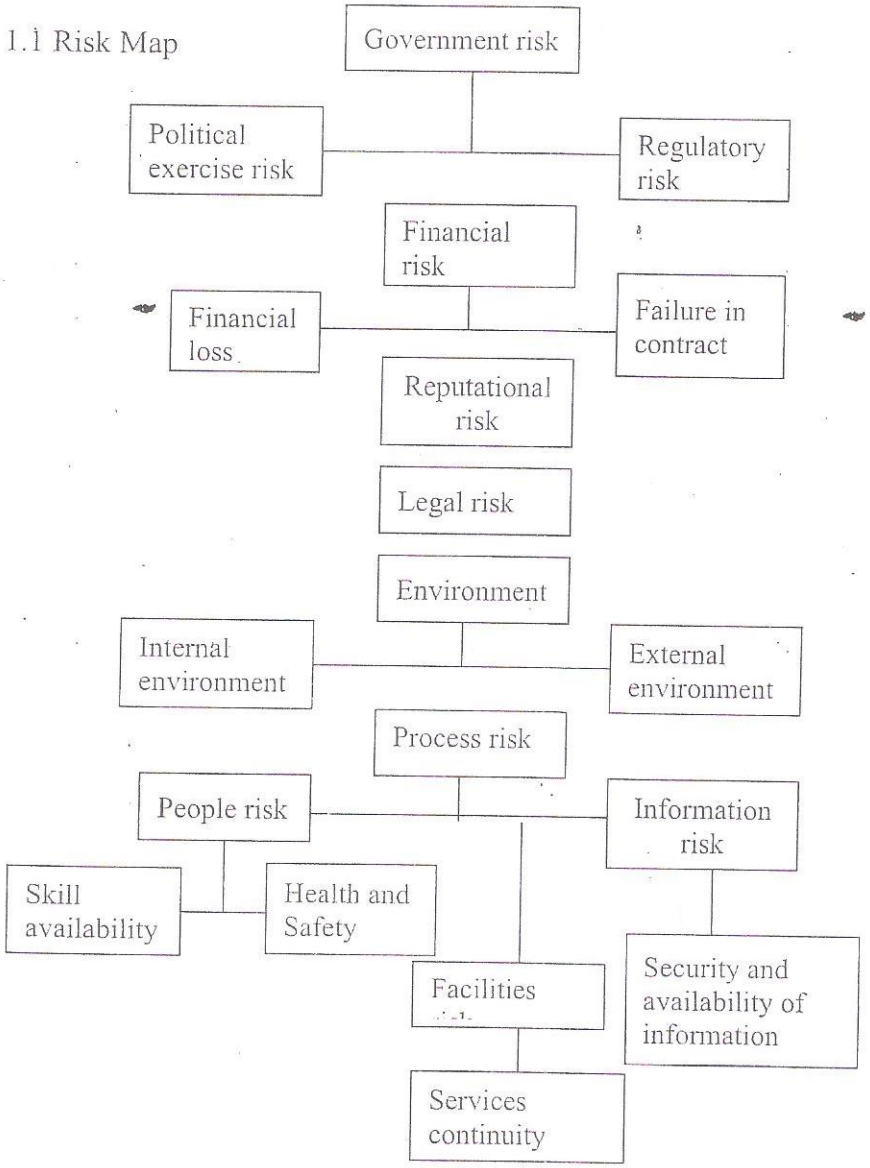
Liabilities

These are the legal liabilities, which the organization owes others as aresult of wrongdoing. It could be as a result of injury to third partyproperty.

Risk Map

The risk map describes how risks can be presented graphically. Thisassists the organization to have a picture of its risk exposures. Anexample of risk map is shown below.

Figure 1.1 Risk Map



Source (Kaye) Risk Management, P. 1-2

SELF ASSESSMENT EXERCISE 3

Explain what you understand by the term speculative risk?

4.0 CONCLUSION

In this unit you have learnt important issues that relate to risk in anorganization and the different stakeholders in an organization.

5.0 SUMMARY

We have dealt with the meaning of risk, types of risks, relationshipbetween risk and the objectives of an organization, etc. The unit thatfollows is a continuation of the analysis. Therefore, in the next studyunit, we shall treat risk and uncertainty.

6.0 TUTOR - MARKED ASSIGNMENT

Identify six stakeholders to an organization and discuss their roles.

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UNIT 3 RISK AND UNCERTAINTY

CONTENTS

1.0 INTRODUCTION

Risk and Uncertainty are critical aspects of our lives. While some events of life involve losses, others may not. Some of these losses might be common and somewhat predictable; many others are shocking, unexpected events. Each involves risk or uncertainty. While the basic element of risk has been discussed in this Unit 2, our focus is to provide a further insight into risk and uncertainty. The discussion will additionally dwell on attitude to risk and uncertainty.

2.0 OBJECTIVES

After you have completed this unit, you should be able to:

- Explain the term uncertainty
- Distinguish between risk and uncertainty
- Differentiate between objective and subjective risks
- Discuss the different attitudes to risk

3.0 MAIN CONTENT

3.1 Risk and Uncertainty Distinguished

Even though no statistical treatment of risk is envisaged in this study, some basic facts from that approach seem necessary for proper understanding of the concepts under discussion. Indeed, it is true that the future cannot be known precisely by man. However, there are events or development of events that can be known up to a given point in time, past or present and which can be analyzed statistically in order to forecast what the future hold for the event(s).

Under condition of risk, a person or a decision maker is faced with a situation in which results of an action or decision are not totally known, but will probably fall within a possible range of outcomes. Here there could be more than one possible outcomes resulting from the selection of an option. The decision maker is assumed to know the probability of occurrence of each outcome. The decision maker's problem is to estimate, the mathematical probabilities of occurrence. Basically, some errors of estimate, forecast or prediction are bound to occur, this error being termed risk, implying the error of being wrong- in one's prediction. Happily enough, statisticians have a way of determining such errors and measuring them. Indeed, the decision maker can determine from past experience the objective probability and relative frequency of the

occurrence of various outcomes. Thus, measurements could be possible with the aid of past experience and record kept. Examples of measurable events are births, vehicular traffic, death, population structure, schools and school attendance, number of buildings in a town, etc. (Oluoma, 1999:10).

Under uncertainty condition, the decision maker has difficulty assigning probabilities to outcomes either because there is a lack of information or an absence of knowledge concerning what outcome can be expected. In other words, there are either two main possible outcomes or too many known facts or both. In this case, the decision maker cannot predict the outcome with any degree of confidence. In fact since the possible outcomes of the event under consideration and/or their probabilities are unknown, it is difficult to measure or forecast accurately. This situation is faced frequently by mangers when entirely new products or services are being introduced. Other examples of non-measurable events are salvation in religion, state of mind, etc.

In addition, unlike risk, uncertainty is a subjective phenomenon. The implication is that two or more individuals are unlikely to have identical views of the outcome of decisions taken under condition of uncertainty. Consequently, it is very difficult to develop universally acceptable techniques for dealing with uncertainty. In practice, a decision maker faced with uncertainty would attempt to generate a probability distribution of possible outcomes on the basis of his personal judgment of the situation. For instance, any predication as to which of two teams, hitherto unknown, will win a match is bound to be subject. People are bound to give their opinions according to their fancies of the team.

Risk concerns variations in possible outcomes in a situation. Uncertainty is often used as a synonym for risk, although when so used it usually refers to objective (measurable or quantified) uncertainty.

Economists and Statisticians use this concept when they measure variation in occurrences. On such measure of variation is called the standard deviation which helps predict expected variations from a norm.

Predictability of an expected probability actually occurring is increased as the number of events is increased as evident in the principle of large numbers. (Bickelhaupt, 1974:5).

Still within the realm of uncertainty, there is a dividing line between objective and subjective uncertainty. According to Bickelhaupt, subjective uncertainty which involves a feeling or state of mind as to expected results differs from the above concept of objective uncertainty.

Lack of knowledge as to the real facts, prejudices, unwarranted high hopes, or other factors can cause different predictions. Therefore, different subjective risks occur, and these often deviate from the underlying objective risk. This kind of uncertainty is not readily measurable and is not usually what is meant when the term risk is used.

In summary, risk is associated with measurability while uncertainty with non-measurability of the event(s) or the error(s) of forecast about future situation(s).

Measurability here should be addressed from two important angles:

- Knowledge of the possible outcomes of an event and their probabilities of occurrence; and

- Objectiveness of measurement

SELF ASSESSMENT EXERCISE 1

State the differences between risk and uncertainty

3.2 Subjective Versus Objective Risk

Trieschmann, Gustavson and Hoyt (2001: 5) draw a distinction between subjective and objective risks. According to them, subjective risk refers to the mental state of an individual who experiences doubt or worry as to the outcome of a given event. In addition to being subjective, a particular risk may also be either pure or speculative and either static or dynamic. Subjective risk is essentially the psychological uncertainty that arises from an individual's mental attitude of state of mind.

Objective risk differs from subjective risk primarily in the sense that it is more precisely observable and therefore measurable. In general, objective risk is the probable variation of actual from expected experience. This term is most often used in connection with pure static risks, although it can also be applied to the other types of uncertainties.

The concept of subjective risk is especially important because it provides a way to interpret the behaviour of individuals faced with seemingly identical situations yet arriving at different decision. For example, one person may be ultra conservative and tend always to take the "safe way" out, even in cases that may seem quite risk – free to other decision makers. Objective risk may actually be the same in two cases but may be viewed very differently by those examining this risk from their own perspectives. Thus, it is not enough to know only the degree of objective risk; the attitude towards risk of the person who will act onthe basis of this knowledge must also be known.

SELF ASSESSMENT EXERCISE 2

State the differences between subjective and objective risk.

3.3 Subjective Risk and Attitude to Risk

Before going further into the intricate aspects of risk management it will be necessary to briefly highlight some basic features of risk and individual's reaction to risks situations which are fundamental ingredients in decision taking toward effective handling of risks.

It should be noted that although a particular type of event may be of such a nature that in principle it ought to be possible to calculate both the probability and the potential variation in particular outcomes, often defects in the quality of the data available to risk managers prevent the calculation of reliable objective estimates of future loss probabilities.

Two common problems are:

- insufficiently large samples (that is, the available details of past experience are based on only a small number of exposure units), and
- changes in risk factors that cast doubts on the usefulness of past experience as a guide to the future.

In such circumstances there is no alternative but to draw on one's experience and judgment to interpret loss trends to arrive at subjective probability estimates. Such estimates may differ

markedly from the underlying true probabilities, not least because the estimator's judgment may be coloured by his own attitude to uncertainty.

When risk cannot be measured objectively with a high degree of accuracy, so that individual judgment and attitudes enter into the process, then subjective risk will be present. Subjective risk has been defined as "the uncertainty of an event as seen or perceived by an individual".

Attitude to risk could be approached from three angles:

a) risk averter,

b) risk optimist/risk seeker

c) risk neutral

To be risk averse implies that a person is willing to pay in excess of the expected return in exchange for some certainty about the future. To pay an insurance premium, for example, is to forgo wealth in exchange for the insurer's promise that covered losses will be paid. Some people refer to this as an exchange of a certain loss (the premium) for an uncertain loss. An important aspect of the exchange is that the premium is larger that the average or expected loss because insurer expenses and profit are included. A person willing only to pay the average loss as a premium would be considered risk neutral. Someone who accepts risk at less than the average loss, perhaps even paying to add risk such as through gambling is a risk seeker. (Pritchett, schmit et al, 1996. p. 4, 7) One person may be very cautious and averse to taking chances, whereas another may be highly optimistic regarding uncertain outcomes: the former (risk averter) is likely to arrive at higher loss probability estimates than the latter (risk optimist). Someone who is strongly averse to accepting even the smallest variation in outcomes from the expected may choose to insure, whereas a less risk adverse individual may be prepared to carry the risk himself. In fact, attitude to risk influences not only subjective estimates of probability but also risk handling decisions.

What causes one person to be more risk averse than another? This is a question best answered by psychologists, sociologists, or anthropologists. However, it is safe to say that family and societal influences, genetics, and religious / philosophical beliefs all play an important role. Somewhat less clear is the relationship between a Person's risk aversion and his or her uncertainty; a problem that is influenced by the imprecise way the terms "aversion" and uncertainty" commonly are used. In some respects, uncertainty could be affected by aversion. For example, an individual might be so wary of risk in general that he/she would tend to discount his / her own judgment regarding a particular risk. In that respect, her/his own level of uncertainty regarding a particular risk might be driven higher by her / his aversion to risk. In other situations, it is possible to say that uncertainty influences aversion, in that a person consistently exposed to an environment of seemingly random and unpredictable events (say, a citizen of Sarajevo) might eventually develop a high level of aversion to risk. (Williams, Smith and Young, 1995: 7)

Some scholars have taken a different approach in relating to risk, risk aversion, and uncertainty to one another. For instance, William and Heins (1989) discuss risk as consisting of objective and subjective components. Objective risk refers to the measurable component of risk, while

subjective risk reflects an individual reaction to (attitude towards) risk. In this approach, uncertainty becomes an aspect of subjective risk.

Other views are possible and perhaps the best that can be said is that risk aversion and uncertainty are distinct concepts that are not fully independent of one another. (Williams, Smith and Young, 1995: 7)

SELF ASSESSMENT EXERCISE 3

Distinguish between a risk averter and a risk optimist.

4.0 CONCLUSION

Risk and uncertainty are two concepts that occupy the center stage of human and business activities. They can make or man the future of any entity. What ever degree or level they assume at any circumstance and the response or attitude of the individual or business will determine the extent to which they can be taken to play negative or respectful role.

5.0 SUMMARY

You have learnt in this unit that risk and uncertainty are central in measuring organizational performance. We have equally discovered that attitude to risk is vital to determining the best part to take in resolving organizational problems. It is thus, trite to assert that a conscious effort in handling organizational risks must start with a proper synergy of risk and uncertainty and the adaptability of organizations to such business dynamics. In the next unit, we shall discuss the impact of risk and uncertainty

6.0 TUTOR - MARKED ASSIGNMENT

Distinguish between risk and uncertainty.

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UNIT 4 COMPETITION AND MARKETING PLANS

CONTENTS

1.0 INTRODUCTION

Every firm is most concerned with its profitability. One of the most frequently used tools of financial ratio analysis is profitability ratios which are used to determine the company's bottom line and its return to its investors. Profitability measures are important to company managers and owners alike. If a small business has outside investors who have put their own money into the company, the primary owner certainly has to show profitability to those equity investors.

Profitability ratios show a company's overall efficiency and performance. We can divide profitability ratios into two types: margins and returns. Ratios that show margins represent the firm's ability to translate sales dollars into profits at various stages of measurement. Ratios that show returns represent the firm's ability to measure the overall efficiency of the firm in generating returns for its shareholders.

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2.0 OBJECTIVES

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

• explain the meaning of profit
• discuss social profitability plans and how they are designed.

3.0 MAIN CONTENT

3.1 *Social Profitability*

The second row of the accounting matrix utilizes social prices, as indicated in Table 2.1. These valuations measure comparative advantage or efficiency in the agricultural commodity system. Efficient outcomes are achieved when an economy's resources are used in activities that create the highest levels of output and income. Social profits, H, are an efficiency measure because outputs, E, and inputs, F + G, are valued in prices that reflect scarcity values or social

opportunity costs. Social profits, like the private analogue, are the difference between revenues and costs, all measured in social prices-H = (E - F - G).

For outputs (E) and inputs (F) that are traded internationally, the appropriate social valuations are given by world prices-cif import prices for goods or services that are imported or fob export prices for exportables. World prices represent the government's choice to permit consumers and producers to import, export, or produce goods or services domestically; the social value of additional domestic output is thus the foreign exchange saved by reducing imports or earned by expanding exports (for each unit of production, the cif import or fob export price). Because of global output fluctuations or distorting policies abroad, the appropriate world prices might not be those that prevail during the base year chosen for the study. Instead, expected long-run values serve as social valuations for tradable outputs and inputs.

The services provided by domestic factors of production-labor, capital, and land-do not have world prices because the markets for these services are considered to be domestic. The social valuation of each factor service is found by estimation of the net income forgone because the factor is not employed in its best alternative use. This approach requires the commodity systems under analysis to be excluded from social factor price determination. For example, if land is planted to wheat, it cannot grow barley during the identical crop season; the social opportunity cost of the land for the wheat system is thus the net income lost because the land cannot produce barley. Similarly, the labor and capital used to produce wheat cannot simultaneously provide services elsewhere in agriculture or in other sectors of the economy. Their social opportunity costs are measured by the net income given up because alternative activities are deprived of the labor and capital services applied to wheat production.

The practice of social valuation of domestic factors begins with a distinction between mobile and fixed factors of production. Mobile factors, usually capital and labor, are factors that can move from agriculture to other sectors of the economy, such as industry, services, and energy. For mobile factors, prices are determined by aggregate supply and demand forces. Because alternative uses for these factors are available throughout the economy, the social values of capital and labor are determined at a national level, not solely within the agricultural sector. Actual wage rates for labor and rates of return to capital investment are therefore affected by a host of policies, some of which may distort factor prices directly. An enforced and binding minimum-wage law, for example, raises the market wage above what it would have been in the absence of policy and causes observed wages to be higher than the social opportunity cost of labor. But indirect effects can also be important. Distortions of output prices cause different activities to expand or contract, altering in turn the demand and prices of mobile domestic factors.

Fixed, or immobile, factors of production are the factors whose private or social opportunity costs are determined within a particular sector of the economy. The value of agricultural land, for

example, is usually determined only by the land's worth in growing alternative crops. Because land is immobile, its value is not directly affected by events in the industrial and service sectors of the economy. But the social opportunity cost of farmland is sometimes difficult to estimate. Within any agroclimatic zone, complete specialization in the most profitable crop is rarely observed. Instead, farmers prefer rotations or intercropping systems that reduce risks of income losses from price variability, yield losses, and pest and disease infestation. Therefore, the social opportunity cost of the land is not accurately approximated by the net profitability's of a single best alternative crop; instead, it is measured by some weighted average of the social profits accruing from the set of crops planted. Because the correct weights and social profits associated with each crop in the set are generally not known, it is convenient in assessing farming activities to reinterpret crop profits as rents to land and other fixed factors (for example, management and the ability to bear risk) per hectare of land used. This reinterpretation includes private (and social) returns to land as parts of D (and H). Profitability per hectare is then interpreted as the ability of a farming activity to cover its long-run variable costs, in either private or social prices or as a return to fixed factors such as land, management skill, and water resources.

SELF ASSESSMENT EXERCISE

In evaluating the outlook for profitability, list and discuss four items that you think are important.

3.2.0 Margin Ratios

Gross Profit Margin

The gross profit margin looks at cost of goods sold as a percentage of sales. This ratio looks at how well a company controls the cost of its inventory and the manufacturing of its products and subsequently pass on the costs to its customers. The larger the gross profit margin, the better for the company. The calculation is: Gross Profit/Net Sales = ____%. Both terms of the equation come from the company's income statement.

3.2.1 Operating Profit Margin

Operating profit is also known as EBIT and is found on the company's income statement. EBIT is earnings before interest and taxes. The operating profit margin looks at EBIT as a percentage of sales. The operating profit margin ratio is a measure of overall operating efficiency, incorporating all of the expenses of ordinary, daily business activity. The calculation is: EBIT/Net Sales = _____%. Both terms of the equation come from the company's income statement.

3.2.2 Net Profit Margin

When doing a simple profitability ratio analysis, net profit margin is the most often margin ratio used. The net profit margin shows how much of each sales dollar shows up as net income after all expenses are paid. For example, if the net profit margin is 5%, that means that 5 cents of every dollar is profit.

The net profit margin measures profitability after consideration of all expenses including taxes, interest, and depreciation. The calculation is: Net Income/Net Sales = _____%. Both terms of the equation come from the income statement.

3.2.3 Cash Flow Margin

The Cash Flow Margin ratio is an important ratio as it expresses the relationship between cash generated from operations and sales. The company needs cash to pay dividends, suppliers, service debt, and invest in new capital assets, so cash is just as important as profit to a business firm.

The Cash Flow Margin ratio measures the ability of a firm to translate sales into cash. The calculation is: Cash flow from operating cash flows/Net sales = _____%. The numerator of the equation comes from the firm's Statement of Cash Flows. The denominator comes from the Income Statement.The larger the percentage, the better.

3.2.4 Returns Ratios

Return on Assets (also called Return on Investment)

The Return on Assets ratio is an important profitability ratio because it measures the efficiency with which the company is managing its investment in assets and using them to generate profit. It measures the amount of profit earned relative to the firm's level of investment in total assets. The return on assets ratio is related to the asset management category of financial ratios.

The calculation for the return on assets ratio is: Net Income/Total Assets = _____%. Net Income is taken from the income statement and total assets is taken from the balance sheet. The higher the percentage, the better, because that means the company is doing a good job using its assets to generate sales.

3.2.5 Return on Equity

The Return on Equity ratio is perhaps the most important of all the financial ratios to investors in the company. It measures the return on the money the investors have put into the company. This is the ratio potential investors look at when deciding whether or not to invest in the company. The calculation is: Net Income/Stockholder's Equity = _____%. Net income comes from the income statement and stockholder's equity comes from the balance sheet. In general, the higher

the percentage, the better, with some exceptions, as it shows that the company is doing a good job using the investors' money.

3.2.6 Cash Return on Assets

The cash return on assets ratio is generally used only in more advanced profitability ratio analysis. It is used as a comparison to return on assets since it is a cash comparison to this ratio as return on assets is stated on an accrual basis. Cash is required for future investments. The calculation is: Cash flow from operating activities/Total Assets = _____%. The numerator is taken from the Statement of Cash Flows and the denominator from the balance sheet. The higher the percentage, the better.

3.2.7 Comparative Data

Financial ratio analysis is only a good method of financial analysis if there is comparative data available. The ratios should be compared to both historical data for the company and industry data.

3.3 Effects of Divergences

The second identity of the accounting matrix concerns the differences between private and social valuations of revenues, costs, and profits. For each entry in the matrix-measured vertically-any divergence between the observed private (actual market) price and the estimated social (efficiency) price must be explained by the effects of policy or by the existence of market failures. This critical relationship follows directly from the definition of social prices. Social prices correct for the effects of distorting policies-policies that lead to an inefficient use of resources. These policies often are introduced because decision-makers are willing to accept some inefficiencies (and thus lower total income) in order to further nonefficiency objectives, such as the redistribution of income or the improvement of domestic food security.

In this circumstance, assessing the tradeoffs between efficiency and nonefficiency objectives becomes a central part of policy analysis.

But not all policies distort the allocation of resources. Some policies are enacted expressly to improve efficiency by

Table 2.2: Expanded Policy Analysis Matrix

	Revenues	**Costs**		**Profits**
		Tradable Inputs	Domestic Factors	
Private Prices	**A**	**B**	**C**	**D**
Social Prices	**E**	**F**	**G**	**G**

Diverges and efficient policy	**I**	**J**	**K**	**L**
Effects of market failures	**M**	**N**	**O**	**P**
Effects of distorting policy	**Q**	**R**	**S**	**T**
Effects of efficient policy	**U**	**V**	**W**	**X**

Table Notes:

Private profits, D, equal A minus B minus C. Social profits, H, equal E minus F minus G. [3]0utput transfers, 1, equal A minus E; they also equal M plus Q plus U. lnput transfers, J, equal B minus F; they also equal N plus R plus V. Factor transfers, K, equal C minus G; they also equal O plus S plus W. Net transfers, L, equal D minus H; they also equal I minus J minus K; and they equal P plus T plus X.

4.0 CONCLUSION

In this unit, we have discussed profitability plans. We have also discussed the social profitability and the*effects of divergences*. Apart from these, we have provided a check list for profitability ratio plan.

5.0 SUMMARY

We have discussed profitability plans and social profitability. We saw how profit ratio relate to each other. The framework for analysis presented discussed social profitability of an organisation's position in the industry.

60 TUTOR-MARKED ASSIGNMENTS

8. Discuss the five basic profit ratio.
9. Use matrix policy to analyse organization cost, revenue and profits.

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UNIT 5 COST BENEFIT ANALYSIS

CONTENT

1.0 INTRODUCTION

COST BENEFIT ANALYSIS

Cost-Benefit Analysis (CBA) estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile.

Cost-Benefit Analysis (CBA) estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile. These projects may be dams and highways or can be training programs and health care systems.

The idea of this economic accounting originated with Jules Dupuit, a French engineer whose 1848 article is still worth reading. The British economist, Alfred Marshall, formulated some of the formal concepts that are at the foundation of CBA. But the practical development of CBA came as a result of the impetus provided by the Federal Navigation Act of 1936. This act required that the U.S. Corps of Engineers carry out projects for the improvement of the waterway system when the total benefits of a project to whomsoever they accrue exceed the costs of that project. Thus, the Corps of Engineers had created systematic methods for measuring such benefits and costs. The engineers of the Corps did this without much, if any, assistance from the economics profession. It wasn't until about twenty years later in the 1950's that economists tried to provide a rigorous, consistent set of methods for measuring benefits and costs and deciding

whether a project is worthwhile. Some technical issues of CBA have not been wholly resolved even now but the fundamental presented in the following are well established.

2.0 OBJECTIVES

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

- explain impact of profitability and its usage in project analysis.
- identify the logistics behind private and social profitability.
- explain the policy analysis matrix.

3.0 MAIN CONTENT

3.1 Principles of Cost Benefit Analysis

One of the problems of CBA is that the computation of many components of benefits and costs is intuitively obvious but that there are others for which intuition fails to suggest methods of measurement. Therefore some basic principles are needed as a guide.

There Must Be a Common Unit of Measurement

In order to reach a conclusion as to the desirability of a project all aspects of the project, positive and negative, must be expressed in terms of a common unit; i.e., there must be a "bottom line." The most convenient common unit is money. This means that all benefits and costs of a project should be measured in terms of their equivalent money value. A program may provide benefits which are not directly expressed in terms of dollars but there is some amount of money the recipients of the benefits would consider just as good as the project's benefits. For example, a project may provide for the elderly in an area a free monthly visit to a doctor. The value of that benefit to an elderly recipient is the minimum amount of money that that recipient would take instead of the medical care. This could be less than the market value of the medical care provided. It is assumed that more esoteric benefits such as from preserving open space or historic sites have a finite equivalent money value to the public.

Not only do the benefits and costs of a project have to be expressed in terms of equivalent money value, but they have to be expressed in terms of dollars of a particular time. This is not just due to the differences in the value of dollars at different times because of inflation. A dollar available

five years from now is not as good as a dollar available now. This is because a dollar available now can be invested and earn interest for five years and would be worth more than a dollar in five years. If the interest rate is r then a dollar invested for t years will grow to be (1+r)t. Therefore the amount of money that would have to be deposited now so that it would grow to be one dollar t years in the future is (1+r)-t. This called the discounted value or present value of a dollar available t years in the future.

When the dollar value of benefits at some time in the future is multiplied by the discounted value of one dollar at that time in the future the result is discounted present value of that benefit of the project. The same thing applies to costs. The net benefit of the projects is just the sum of the present value of the benefits less the present value of the costs.

CBA Valuations Should Represent Consumers or Producers Valuations As Revealed by Their Actual Behavior

The valuation of benefits and costs should reflect preferences revealed by choices which have been made. For example, improvements in transportation frequently involve saving time. The question is how to measure the money value of that time saved. The value should not be merely what transportation planners think time should be worth or even what people say their time is worth. The value of time should be that which the public reveals their time is worth through choices involving tradeoffs between time and money. If people have a choice of parking close to their destination for a fee of 50 cents or parking farther away and spending 5 minutes more walking and they always choose to spend the money and save the time and effort then they have revealed that their time is more valuable to them than 10 cents per minute. If they were indifferent between the two choices they would have revealed that the value of their time to them was exactly 10 cents per minute.

3.2 Challenges of CBA

The most challenging part of CBA is finding past choices which reveal the tradeoffs and equivalencies in preferences. For example, the valuation of the benefit of cleaner air could be established by finding how much less people paid for housing in more polluted areas which otherwise was identical in characteristics and location to housing in less polluted areas.

Generally the value of cleaner air to people as revealed by the hard market choices seems to be less than their rhetorical valuation of clean air.

3.3 Benefits of CBA

Benefits Are Usually Measured by Market Choices

When consumers make purchases at market prices they reveal that the things they buy are at least as beneficial to them as the money they relinquish. Consumers will increase their consumption of any commodity up to the point where the benefit of an additional unit (marginal benefit) is equal to the marginal cost to them of that unit, the market price. Therefore for any consumer buying some of a commodity, the marginal benefit is equal to the market price. The marginal benefit will decline with the amount consumed just as the market price has to decline to get consumers to consume a greater quantity of the commodity. The relationship between the market price and the quantity consumed is called the demand schedule. Thus the demand schedule provides the information about marginal benefit that is needed to place a money value on an increase in consumption.

Some Measurements of Benefits Require the Valuation of Human Life

It is sometimes necessary in CBA to evaluate the benefit of saving human lives. There is considerable antipathy in the general public to the idea of placing a dollar value on human life. Economists recognize that it is impossible to fund every project which promises to save a human life and that some rational basis is needed to select which projects are approved and which are turned down. The controversy is defused when it is recognized that the benefit of such projects is in reducing the risk of death. There are many cases in which people voluntarily accept increased risks in return for higher pay, such as in the oil fields or mining, or for time savings in higher speed in automobile travel. These choices can be used to estimate the personal cost people place on increased risk and thus the value to them of reduced risk. This computation is equivalent to placing an economic value on the expected number of lives saved.

The Analysis of a Project Should Involve a With Versus Without Comparison

The impact of a project is the difference between what the situation in the study area would be with and without the project. This that when a project is being evaluated the analysis must estimate not only what the situation would be with the project but also what it would be without the project. For example, in determining the impact of a fixed guideway rapid transit system such as the Bay Area Rapid Transit (BART) in the San Francisco Bay Area the number of rides that would have been taken on an expansion of the bus system should be deducted from the rides provided by BART and likewise the additional costs of such an expanded bus system would be deducted from the costs of BART. In other words, the alternative to the project must be explicitly specified and considered in the evaluation of the project. Note that the with-and-without comparison is not the same as a before-and-after comparison.

Another example shows the importance of considering the impacts of a project and a with-and-without comparison. Suppose an irrigation project proposes to increase cotton production in Arizona. If the United States Department of Agriculture limits the cotton production in the U.S. by a system of quotas then expanded cotton production in Arizona might be offset by a reduction in the cotton production quota for Mississippi. Thus the impact of the project on cotton production in the U.S. might be zero rather than being the amount of cotton produced by the project.

Cost Benefit Analysis Involves a Particular Study Area

The impacts of a project are defined for a particular study area, be it a city, region, state, nation or the world. In the above example concerning cotton the impact of the project might be zero for the nation but still be a positive amount for Arizona.

The nature of the study area is usually specified by the organization sponsoring the analysis. Many effects of a project may "net out" over one study area but not over a smaller one. The

specification of the study area may be arbitrary but it may significantly affect the conclusions of the analysis.

Double Counting of Benefits or Costs Must be Avoided

Sometimes an impact of a project can be measured in two or more ways. For example, when an improved highway reduces travel time and the risk of injury the value of property in areas served by the highway will be enhanced. The increase in property values due to the project is a very good way, at least in principle, to measure the benefits of a project. But if the increased property values are included then it is unnecessary to include the value of the time and lives saved by the improvement in the highway. The property value went up because of the benefits of the time saving and the reduced risks. To include both the increase in property values and the time saving and risk reduction would involve double counting.

Decision Criteria for Projects

If the discounted present value of the benefits exceeds the discounted present value of the costs then the project is worthwhile. This is equivalent to the condition that the net benefit must be positive. Another equivalent condition is that the ratio of the present value of the benefits to the present value of the costs must be greater than one.

If there are more than one mutually exclusive project that have positive net present value then there has to be further analysis. From the set of mutually exclusive projects the one that should be selected is the one with the highest net present value.

If the funds required for carrying out all of the projects with positive net present value are less than the funds available this means the discount rate used in computing the present values is too low and does not reflect the true cost of capital. The present values must be recomputed using a higher discount rate. It may take some trial and error to find a discount rate such that the funds required for the projects with a positive net present value is no more than the funds available. Sometimes as an alternative to this procedure people try to select the best projects on the basis of

some measure of goodness such as the internal rate of return or the benefit/cost ratio. This is not valid for several reasons.

Introduction of Project Decision Criteria's

NPV, IRR, PV etc.

SELF-ASSESSMENT EXERCISE

1) What are the challenges of CBA
2) Discuss the principles of CBA

4.0 CONCLUSION

A cost benefit analysis is done to determine how well, or how poorly, a planned action will turn out. Although a cost benefit analysis can be used for almost anything, it is most commonly done on financial questions. Since the cost benefit analysis relies on the addition of positive factors and the subtraction of negative ones to determine a net result, it is also known as running the numbers.

5.0 SUMMARY

This unit focuses on CBA with core objectives on the usage of CBA in project analysis. Further explanation based on challenges and benefits of CBA with criteria for project selection. The impacts of a project are defined for a particular study area was considered .A cost benefit analysis is done to determine how well, or how poorly, a planned action will turn out. Although a cost benefit analysis can be used for almost anything, it is most commonly done on financial questions.

6.0 TUTOR-MARKED ASSIGNMENT

Review the articles that surround CBA.

7.0 REFERENCES/FURTHER READING

"Albert Humphrey The "Father" of TAM". TAM UK.Retrieved 2012-06-03.

See for instance: Mehta, S. (2000) Marketing Strategy

UNIT 6:EVALUATION TECHNIQUES

CONTENT

1.0 INTRODUCTION

Evaluation provides information used in the decision-making process. Evaluation is simpler for direct financial investment which leads into clearly measured outcome (profit). Techniques and methods for evaluating projects are used for assessing whether and how fast the fund invested will return. Various evaluation techniques will be discussed in detail in this unit.

2.0 OBJECTIVES

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

- Explain evaluation
- Discuss evaluation techniques as well as identify their merits and demerits
- Compute how companies can value any projects they're considering to invest in whether they are worth undertaking.

3.0 MAIN CONTENT

3.1 What is Evaluation?

Evaluation is the systematic and objective assessment of an on-going or completed project or programme, its design, implementation and results. The aim is todetermine the relevance and fulfillment of objectives, development efficiency,effectiveness, impact and sustainability. Also, evaluation involves a comprehensive assessment of the given project, policy,programme or investments, taking into account all its stages: planning, implementation, and monitoring of results. It provides information used in the decision-making process.Evaluation is one of the core duties of a fundamental project analyst, as evaluations (along with cash flows) are typically the most important drivers of project prices over the long term. Evaluation should answer the simple yet vital question: what is something worth? The analysis is then based on either current data or projections of the future.

For evaluation, it is important to determine the cash flows of a project. These cash flows can be segmented as follows: 1. *Initial Investment Outlay*(these are the costs that are needed to start the project, such as new equipment, installation, etc.); 2. *Operating Cash Flow over a Project's Life*(this is the additional cash flow a new project generates); and 3. *Terminal-Year Cash Flow* (this is the final cash flow - inflows and outflows and salvage value).

Purposes of project evaluations - Evaluations contribute to secure theoptimal quality and impact of development interventions. They also help managers ofprojects and programmes to manage and improve their implementation. The purposes of evaluations are:

1. Learning from experience: With the assistance of evaluations, successes andfailures can be interpreted. Based on those experiences, both current and futureprojects and programmes can be improved.
2. Transparency: Evaluations illustrate the responsible utilization of the resourcesand justify the results and their effects vis-à-vis the contractor, the partners, thetarget groups in the recipient country and the tax payers.
3. Deepening understanding: Evaluation is a tool for deepening knowledge andunderstanding of the assumptions, options and limits of development cooperation.
4. Improved communication: An evaluation is intended to foster communication andunderstanding within and between the groups mentioned above, even if this canonly be managed in different ways and with different participations in each case.

Evaluation is simpler for direct financial investment which leads into clearly measured outcome (profit) than indirect financial investment which leads to measuring future success (when financial result may not be clear at first sight or in the short term).

3.2 Evaluation Technique

Evaluation techniques are used to evaluate the potential merits of an investment or to objectively assess the value of a project or asset.The techniques and methods for evaluating projects are used for assessing whether and how fast the fund invested will return. There are many techniques and methods for assessing the financial evaluation and success factor evaluation of investment. For ***success factor evaluation***, we have the following techniques:

a) Query techniques: this technique requires asking people through interviews (structured and unstructured) and questionnaires. Interviews require that all interviewees be asked

the questions, in an order. Questionnaires can be conducted in person, by telephone, or by mail as a medium to quickly obtaininformation from a wide variety of people.

b) Observational methods: this evaluation method involves listening, watching, and documenting what is seen and heard. Through asking questions, and by noting comments, behaviours and reactions, useful information is provided to the evaluation process. The method gathers accurate information about how a group and project operates in the field.

c) Field or site studies: this could be in the form of photographic and holographic records. The use of photographic records is useful as amethod to monitor a site over time, and can be used as an evaluation tool combined with other methods. Holographic records capture the appearance of a coastal site, and allow comparisons of before and aftermanagement actions and are useful for on-ground projects.

For ***financial evaluation***, there are a large number of techniques. They can be distinguished into two groups:

a) Statistical methods or Static evaluation methods

b) Dynamic evaluation methods.

A) Static Evaluation Methods

These evaluation techniques focus especially on monitoring of cash benefits or measuring of the initial expenditure. They do not include a risk factor in evaluation and take the time factor into account only in a limited extent. In other words, they do not consider the time value of money. Evaluation techniques here are:

1. Accounting Rate of Return
2. Payback Period

3. Annual Percentage Rate

1. Accounting Rate of Return (ARR)

Accounting rate of return (also known as simple rate of returnor average rate of return) is the ratio of estimated accounting profit of a project to the average investment made in the project. ARR is used in investment appraisal. It is given as

$$ARR = \frac{Average\ Accounting\ Profit}{Average\ Investment}$$

Average accounting profit is the arithmetic mean of accounting income expected to be earned during each year of the project's life time. Average investment may be calculated as the sum of the beginning and ending book value of the project divided by 2. Another variation of ARR formula uses initial investment instead of average investment.

Advantages:

1. Like payback period, this method of investment appraisal is easy to calculate.
2. It recognizes the profitability factor of investment.

Disadvantages:

1. It ignores time value of money. Suppose, if we use ARR to compare two projects having equal initial investments. The project which has higher annual income in the latter years of its useful life may rank higher than the one having higher annual income in the beginning years, even if the PV of the income generated by the latter project is higher.
2. It can be calculated in different ways. Thus there is problem of consistency.

3. It uses accounting income rather than cash flow information. Thus it is not suitable for projects which having high maintenance costs because their viability also depends upon timely cash inflows.

***Decision Rule**:* Accept the project only if it's ARR is equal to or greater than the required ARR. In case of mutually exclusive projects, accept the one with highest ARR.

Example: An initial investment of N130, 000 is expected to generate annual cash inflow of N32, 000 for 6 years. Depreciation is allowed on the straight line basis. It is estimated that the project will generate scrap value of N10, 500 at end of the 6th year. Calculate its accounting rate of return assuming that there are no other expenses on the project.

Solution

Annual Depreciation = (Initial Investment − Scrap Value) ÷ Useful Life in Years

Annual Depreciation = (130,000 − 10,500) ÷ 6 ≈ 19,917

Average Accounting Income = 32,000 − 19,917 = 12,083

Accounting Rate of Return = 12,083 ÷ 130,000 ≈ 9.3%

2. Payback Period

The payback period, also called the payback rule, is the length of time required to recover the cost of an investment.The PB reveals how many years are required to for the cash inflows to equate to the one million dollar outflow. A short PB period is preferred as it indicated that the project will "pay for itself" within a smaller time frame. Since the payback period does not reflect the added value of a capital budgeting decision, it is usually considered the least relevant valuation approach. However, if liquidity is a vital consideration, PB periods are of major importance. It is given as:

$$PB\ Period = \frac{Cost\ of\ Project}{Annual\ Cashflows}$$

Advantages and Disadvantages

Advantages: Payback periods are typically used when liquidity presents a major concern. If a company only has a limited amount of funds, they might be able to only undertake one major project at a time. Therefore, management will heavily focus on recovering their initial investment in order to undertake subsequent projects. Another major advantage of using the PB is that it is easy to calculate once the cash flow forecasts have been established.

Disadvantages: While the payback rule appears very straightforward, there are two significant disadvantages with this method.

1. It ignores the time value of money.
2. It ignores any benefits that occur after the payback period and therefore does not measure profitability.

Decision Rule: If the discounted payback period is less that the target period, accept the project. Otherwise reject. For mutually exclusive projects, the better investment is the one with the shortest payback period.

Example 1: If a project cost N100,000 and is expected to return N20,000 annually, what is the payback period?

Solution: Payback period = N100,000 / N20,000

= 5 years

Example 2: Given the following investment Inflows

Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
-1,000,000	300,000	300,000	300,000	300,000	300,000

Solution: Payback period = N1,000,000 / N30,000

= 3.33 = 3 years and 4 months

B) Dynamic Evaluation Methods

These evaluation techniques take into account the time and risk factors. In other words, they do not consider the time value of money. The basis is the discounting of input parameters. Evaluation techniques here are:

1. Net Present Value (NPV)
2. Internal Rate of Return (IRR)
3. Profitability Index (PI)
4. Discounted Payback Period (DPP)

1. Net Present Value

Net present value (NPV) is the present value of an investment's expected cash inflows minus the costs of acquiring the investment.NPV is used to analyze an investment decision and give company management a clear way to tell if the investment will add value to the company. Typically, if an investment has a positive net present value, it will add value to the company and benefit company shareholders. For example, if a company decides to open a new product line, they can use NPV to find out if the projected future cash inflows cover the future costs of starting and running the project. If the project has a positive NPV, it adds value to the company and therefore should be considered. The formula for NPV is given as:

$$NPV = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \cdots + \frac{C_n}{(1+r)^n} - C_0$$

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

Where C_1 = cash flow at time n; r = cost of capital; C_0 = initial project cost

Decision rule: The management should accept all projects with positive NPVs and thereby maximize the company's value. For independent projects, accept project with positive NPV and reject project with negative NPV. For mutually exclusive projects, select the project with the highest positive NPV.

Illustration 1: OdifePlc is to undertake a project worth ₦10m and having the following cash flow profile with a discount rate of 25%. Compute the Net Present Value.

Year	CF (N)
1	5,000,000
2	6,000,000
3	8,000,000

Solution

Year	**CF(₦)**	**DF at 25%**	**PV (₦)**
0	(10,000,000)	1	(10,000,000)
1	5,000,000	0.8000	4,000,000
2	6,000,000	0.6400	3,840,000
3	8,000,000	0.5120	4,096,000
		NPV	1,936,000

2. Internal Rate of Return

Internal rate of return (IRR) is the interest rate at which the net present value of all the cash flows (both positive and negative) from a project or investment equal zero. Internal rate of return is

used to evaluate the attractiveness of a project or investment.Also, IRR is best-suited for analyzing venture capital and private equity investments, which typically entail multiple cash investments over the life of the business, and a single cash outflow at the end via IPO or sale.

Advantages and Disadvantages of IRR

Advantages: IRR considers the time value of money. Also, it allows managers to rank projects by their overall rates of return rather than their net present values. The ease of comparison makes IRR attractive, but there are limits to its usefulness. For example, IRR works only for investments that have an initial cash outflow followed by one or more cash inflows.

Disadvantages: IRR does not measure the absolute size of the investment or the return. This means that IRR can favor investments with high rates of return even if the naira amount of the return is very small. Another short-coming is that IRR can't be used if the investment generates interim cash flows. Finally, IRR does not consider cost of capital and can't compare projects with different durations.

Decision Rule: If the IRR of a new project exceeds a company's required rate of return, that project is desirable. If IRR falls below the required rate of return, the project should be rejected.

$$IRR, 0 = P_0 + P_1(1 + IRR)^1 + P_2(1 + IRR)^2 + P_3(1 + IRR)^3 + \cdots + P_n(1 + IRR)^n$$

Where: P_0, P_1, P_2…,P_n equals the cash flows in periods 0, 1, 2, . . . n, respectively

Example 1: Assume Company XYZ must decide whether to purchase a piece of factory equipment for N300,000. The equipment would only last three years, but it is expected to generate N150,000 of additional annual profit during those years. Company XYZ also thinks it can sell the equipment for scrap afterward for about N10,000. Using IRR, Company XYZ can

determine whether the equipment purchase is a better use of its cash than its other investment options, which should return about 10%.

Solution: IRR, 0 = -$300,000 + ($150,000)/ (1+.2431) + ($150,000)/ $(1+.2431)^2$ + ($150,000)/ $(1+.2431)^3$ + $10,000/ $(1+.2431)^4$

IRR = 24.31%

Decision: From a financial standpoint, Company XYZ should purchase the equipment since this generates a 24.31% return for the company, which is much higher than the 10% return available from other investments.

A general rule of thumb is that the IRR value cannot be derived analytically. Instead, IRR must be found by using mathematical trial-and-error to derive the appropriate rate. However, most business calculators and spreadsheet programs will automatically perform this function. IRR can also be used to calculate expected returns on stocks or investments, including the yield to maturity on bonds. IRR calculates the yield on an investment and is thus different than net present value (NPV) value of an investment. The IRR interpolation formula is given as;

$$IRR = DL + \left\{\frac{NPV_p}{NPV_p - NPV_n}\right\} DH - DL$$

Where: DL = lower discount rate with +ve NPV; DH = higher discount rate with –ve NPV; NPV_p = amount of positive NPV; NPV_n = amount of negative NPV

Example 2**:** Calculate the IRR of a project having the following cash flows

Year	NCF(N)
0	(3610)
1	1000
2	2000

3	3000

Note: In computing IRR using the trial and error method, the student is expected to use any two rates that will give both positive and negative NPVs.

Solution

Year	NCF	DCF at 15%	PV	DCF at 26%	PV
0	(3610)	1	(3610)	1	(3610)
1	1000	0.87	870	0.79	790
2	2000	0.76	1520	0.63	1260
3	3000	0.66	1980	0.50	1500
			760		(60)

$$IRR = DL + \left\{\frac{NPV_p}{NPV_p - NPV_n}\right\} DH - DC$$

$$= 15 + \left\{\frac{760}{760 - (-60)}\right\} 26 - 15$$

$$= 15 + \left\{\frac{760}{760 + 60}\right\} 11$$

$$= 15 + \left\{\frac{760}{820}\right\} 11$$

$$IRR = 15 + 10.20$$

$$IRR = 25.20\%$$

3. Profitability Index

Profitability index is an investment appraisal technique calculated by dividing the present value of future cash flows of a project by the initial investment required for the project.Profitability index is actually a modification of the net present value method. While present value is an absolute measure (i.e. it gives as the total naira figure for a project), the profitability index is a relative measure (i.e. it gives as the figure as a ratio). Profitability index is sometimes called

benefit-cost ratio too and is useful in capital rationing since it helps in ranking projects based on their per naira return. It is given as

$$Profitability\ Index\ (PI) = 1 + \frac{Net\ Present\ Value}{Initial\ Investment\ Required}$$

Decision Rule: Accept a project if the profitability index is greater than 1, stay indifferent if the profitability index is 1 and don't accept (reject) a project if the profitability index is below 1.

Example 1: Company C is undertaking a project at a cost of ₦50 million which is expected to generate future net cash flows with a present value of ₦65 million. Calculate the profitability index.

Solution

Profitability Index = PV of Future Net Cash Flows / Initial Investment Required

Profitability Index = 65M / 50M = 1.3

Net Present Value = PV of Net Future Cash Flows − Initial Investment Required

Net Present Value = 65M - 50M = 15M.

The information about NPV and initial investment can be used to calculate profitability index as follows:

Profitability Index = 1 + (Net Present Value / Initial Investment Required)

Profitability Index = 1 + 15M/50M = 1.3

The decision here is for company C to accept the project.

Example 2: Ancoll Investment Company limited has three projects A, B and C to evaluate and rank using profitability index (PI) criterion. Each project cost of capital is 12% and the after – tax cash flows for each project are as follows:

Year	Project A	Project B	Project C
0	(₦10,000)	(₦30,000)	(₦18,000)
1	2,800	6,000	6,500

2	3,000	10,000	6,500
3	4,000	12,000	6,500
4	4,000	16,000	6,500

Solution

Year	Project A	Project B	Project C
	(10,000)	(30,000)	(18,000)
1	2,800 x 0.893 = 2500.12	6,000 x 0.893 = 5,357.40	6,500 x 0.893 =5,803.85
2	3000 x 0.797 = 2391.60	10,000 x 0.797 = 7972.00	6,500 x 0.797 = 5181.15
3	4,000 x 0.711 = 2847.20	12,000 x 0.711 = 8541.60	6,500 x 0.711 = 4626.70
4	4,000 x 0.636 = 2542.00	16,000 x 0.636 = 10,163.00	6,500 x 6355 = 4130.75
	PV = 10,281	PV = 32,040	PV= 19,744

Project A – PI = $\frac{10,281}{10,000} = 1.0281$ - Third choice

Project B – PI = $\frac{32040}{30,000} = 1.068$ - Second choice

Project C – PI = $\frac{19743}{18,000} = 1.0968$ - First choice

4. Discounted Payback Period

One of the major disadvantages of simple payback period is that it ignores the time value of money. To counter this limitation, an alternative procedure called discounted payback period may be followed, which accounts for time value of money by discounting the cash inflows of the project.In discounted payback period we have to calculate the present value of each cash inflow taking the start of the first period as zero point. For this purpose the management has to set a suitable discount rate. The discounted cash inflow for each period is to be calculated as:

Discounted Cash Inflow = Actual Cash Inflow/$(1 + i)^n$

Where,i is the discount rate;n is the period to which the cash inflow relates.

Usually the above formula is split into two components which are actual cash inflow and present value factor (i.e. $1 / (1 + i)^n$). Thus discounted cash flow is the product of actual cash flow and present value factor.

The rest of the procedure is similar to the calculation of simple payback period except that we have to use the discounted cash flows as calculated above instead of actual cash flows. The cumulative cash flow will be replaced by cumulative discounted cash flow.

$$Discounted\ Payback\ Period = A + \frac{B}{C}$$

Where,A = Last period with a negative discounted cumulative cash flow; B = Absolute value of discounted cumulative cash flow at the end of the period A;C = Discounted cash flow during the period after A.

Note: In the calculation of simple payback period, we could use an alternative formula for situations where all the cash inflows were even. That formula won't be applicable here since it is extremely unlikely that discounted cash inflows will be even.

Advantages and Disadvantages

Advantage: Discounted payback period is more reliable than simple payback period since it accounts for time value of money. It is interesting to note that if a project has negative net present value it won't pay back the initial investment.

Disadvantage: It ignores the cash inflows from project after the payback period.

Decision Rule: If the discounted payback period is less that the target period, accept the project. Otherwise reject.

Example: An initial investment of $2,324,000 is expected to generate $600,000 per year for 6 years. Calculate the discounted payback period of the investment if the discount rate is 11%.

Solution

Step 1: Prepare a table to calculate discounted cash flow of each period by multiplying the actual cash flows by present value factor. Create a cumulative discounted cash flow column.

Year n	**Cash Flow CF ₦**	**Present Value Factor PV₦1=1/(1+i)n**	**Discounted Cash Flow CF×PV₦1**	**Cumulative Discounted Cash Flow**
0	−2,324,000	1.0000	−2,324,000	−2,324,000
1	600,000	0.9009	540,541	− 1,783,459
2	600,000	0.8116	486,973	− 1,296,486
3	600,000	0.7312	438,715	− 857,771
4	600,000	0.6587	395,239	− 462,533
5	600,000	0.5935	356,071	− 106,462
6	600,000	0.5346	320,785	214,323

Step 2: Discounted Payback Period = 5 + |-106,462| / 320,785

= 5.32 years

4.0 CONCLUSION

When a firm is presented with a capital budgeting/investment decision on a project, one of its first tasks is to determine whether the project will prove to be profitable. The net present value (NPV), internal rate of return (IRR), payback period (PB) and discounted payback period (DPB) methods are the most common approaches to project selection. Although an ideal capital budgeting solution is such that all three metrics will indicate the same decision, these approaches

will often produce contradictory results. Depending on managements' preferences and selection criteria, more emphasis will be put on one approach over another.

5.0 SUMMARY

In this unit, we have discussed evaluation and evaluation techniques. Evaluation techniques have be talk about under two broad groups – the static evaluation method (Accounting Rate of Return, Payback Period) and the dynamic evaluation methods (Net Present Value, Internal Rate of Return, Profitability Index and Discounted Payback Period).

6.0 TUTOR-MARKED ASSIGNMENTS

10. What is evaluation?

11. Identity three techniques in success factor evaluation and briefly discuss them.

12. Explain Internal Rate of Return and Profitability Index with examples.

7.0 REFERENCES/FURTHER READINGS

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UNIT 7: ASSESSMENT OF PRIVATE PROFITABILITY

CONTENT

1.0 INTRODUCTION

A number of different assessment methods are used by private firms to evaluate whether a particular course of action (construction of a new manufacturing facility, purchase of another business, investment in a sports facility, et cetera) meets the entity's goals or more specifically defined - objectives. In this unit, we considered only financial criteria, such as internal rate of return, net present value, profitability index, payback period, and other proxy measure of profitability such as return on capital employed, return on asset, return on sales, etc.**2.0 OBJECTIVES**

After reading this unit, you should be able to:

- Explain profitability assessment

- Identify the main and proxy criteria for assessing private project profitability

3.0 MAIN CONTENT

3.1 Profitability Assessment

Aprofitability assessment refers to the measurement of the rate of return made by private firm oninvestments in a line of business, company or industry over a time period; andcomparing it against an appropriate benchmark. If the estimated returns arehigher than the benchmark, the investment can be said to be profitable; if lowerthan the benchmark, the investment is unprofitable. This in turn guides theinvestment decision of firms.

Economic activities typically have a pattern of an initial investment (cash outflow/cost),followed by a stream of revenues (cash inflows/benefits) in subsequent periods. Consider the perspective of the private firm. For example, if an electric system operator is considering the construction of an additional thermal power plant,

- the costs of the project equal: the up-front construction costs related to land, labor and materials; annual operating (fuel and other), maintenance and replacement costs; estimates of the costs of unscheduled breakdowns and risks imposed by changes in fuel prices (and other input costs) over time; costs of meeting environmental regulations; and any costs related to the eventual mothballing of the facility. All costs are discounted depending on when they are incurred.
- Benefits are provided by the discounted stream of expected revenues from sales of electricity to households and industry, plus any ‘salvage’ value at the end of the facility’s useful life.

- As long as financial benefits over the lifetime of the project exceed costs, the private investor determines the investment to be feasible. That is, the rate at which the system operator weights the streams of costs and revenues is the rate of return that he or she hopes to earn on the investment. Thus, if the weighted stream of benefits exceeds that of costs, the project earns a higher rate of return on the investment than could be earned elsewhere.

Private profitability assessment excludes spillovers unless the authority specifically requires the firm to pay for access to natural resources, to pay compensation to those 'harmed' by the firm's activities, to pay an environmental tax, to purchase 'pollution rights', or requires the firm to post a bond to offset society's potential future need to mitigate environmental damage caused by the firm's activities. These costs would be included by the firm in its financial analysis of a project. Furthermore, a private profitability assessment uses market prices for natural resources, labor, land and other inputs instead of the opportunity costs of those resources.

Regardless of these limitations, it is important that projects are valued from the perspective of private firms. For example, if the government wants to implement a given project and the financial performance of the project is attractive from a private perspective, it might be wise just to let the private sector pursue it.

3.2 Private Profitability Assessment Criteria

Private projects are usually assessed on the basis of financial criteria such as net present value (NPV), the benefit-cost ratio (BCR), internal rate of return (IRR), and/or modified internal rate of return (MIRR).

A. Net Present Value (NPV)

The NPV is the sum of the discounted benefits minus the sum of the discounted costs of the project over the project lifetime. For ranking projects on the basis of NPV, the following assumptions are needed:

- the discount rate is given and usually taken as the market interest rate;
- capital is always readily available;
- the interest rate for borrowing is the same as the interest rate for lending;
- cash flow projections include all relevant costs and benefits, and taxes; and
- projects are mutually exclusive (so that they can be evaluated separately). Any combination of projects should be considered as a separate option.

If these assumptions are valid, NPV can be expressed as:

$$NPV = \sum_{t=0}^{T} \frac{B_t - C_t}{(1 + r_t)^t}$$

where B_t represents the benefits derived from the project in period *t*, *C*t the costs in period t, *T* is the lifespan of the project and r_t is the interest rate in period t (although the interest or discount rate is generally assumed to remain constant in each period).

If we are evaluating a single project and NPV is greater than zero, the project is worth undertaking. If we are evaluating several projects, the one with the highest NPV should generally be chosen, although that will depend on factors unique to each project. For example, some projects may be riskier than others, or projects have different life spans (in which case one might wish annualize the net discounted benefits of each project in order to make the comparison).

B. ***Benefit-cost ratio (BCR)***

This is the ratio of the discounted total benefits from a project divided by the discounted total costs of the project. It is given as:

$$BCR = \frac{\sum_{t=0}^{T} \frac{B_t}{(1+r_t)^t}}{\sum_{t=0}^{T} \frac{C_t}{(1+r_t)^t}}$$

If the BCR for a single project is larger than 1, then the project increases real wealth. When comparing different projects, however, the problem of scaling appears. For example, a project with total benefits of ₦1 million may generate a greater increase in real wealth than a project with total benefits of ₦100, but the ratio of benefits to costs may not be as high. Thus, projects musthave an equal outlay basis if they are to be compared.

C. Payback Period

For the vast majority of private projects, costs are incurred before any benefits are realized, which is why the term 'cost-benefit analysis' is preferred here to 'benefit-cost analysis'. During the construction phase of a project, a firm incurs costs only – costs are 'front-loaded'. Benefits do not usually accrue until construction is complete. The payback period, therefore, is the point in time when a project's total benefits exceed its total costs. At that time, the project has 'paid back' its initial investment. Both costs and benefits should be discounted when estimating the payback period. The major problem with the payback method is that it ignores cash flows – costs and benefits – that occur beyond the payback period. If this is the only financial criterion taken into account, it is possible then to accept a project that has a negative NPV. Nevertheless, the payback period is a useful indicator for firms that are unsure about future cash-flows and their position in the market. Obviously, firms tend to prefer projects with a shorter payback period.

D. Internal Rate of Return (IRR) and Modified Internal Rate of Return (MIRR)

The IRR is a popular criterion for private project appraisal. The IRR is the discount rate for which the NPV is zero – where the project's discounted benefits exactly balance discounted costs. It is found by setting NPV=0 and solving for *r* (assuming *r* does not change over time).

$$IRR = \sum_{t=0}^{T} \frac{B_t - C_t}{(1 + r_t)^t} = 0$$

The project with the largest IRR is generally preferred, subject to the proviso that the IRR exceeds the interest rate. Despite its popularity, the IRR criterion needs to be used with caution. First, for complex cash flows, there might be more than one IRR for a single project. And second, the IRR approach assumes that the project can both borrow and lend at the internal rate of return. In other words, excess funds generated by the project can be invested externally at the IRR. This is certainly not the case.

The modified IRR (MIRR) is the average annual rate of return that will be earned on an investment if the cash flows are reinvested at the firm's cost of capital. Therefore, MIRR more accurately reflects the profitability of an investment than does IRR. To determine the MIRR, it is necessary to solve the following equation:

$$K_0(1 + MIRR)^T = FV_{cash\ flow}$$

Where, K_0 is the capital investment (effectively calculated at time zero) and $FV_{cash\ flow}$ is the future (as opposed to present) value of the cash flow estimated using the interest rate that reflects the firm's cost of capital.

This literaturesuggests that the internal rate of return (IRR) and the net present value (NPV)are the conceptually correct measures of profitability of an activity (aninvestment, a line of business, or a company). They take into account the inflows and outflows of an activity overtime, and reflect the economic principle of time preference of money. They arealso the two most frequently used profitability measures in the business world.

3.3 Other measures of private profitability

The following describes two broad categoriesof profitability measures, some of which can be used as proxy measures for theIRR and NPV in certain circumstances:

- *accounting ratios* (ROCE, ROE, return on sales, or ROS, and gross margins) are essentially snapshots of a company's performance at particular points in time, and can be obtained from accounting reports, and
- *market valuations* (the Tobin's q, the market-to-book ratio and total returns to shareholders are based on investors' expectations of future returns.

These proxy measures can have some advantages over the IRR or the NPV for the assessment of private profitability. First, theyare often easier and more convenient to obtain than the IRR. Second, there arecertain circumstances under which it would be difficult to estimate the IRR due to imperfect information.

A) Return on Capital Employed

The return on capital employed (ROCE) is a commonly used accounting measureof private profitability, and is calculated as follows:

$$ROCE = \frac{EBIT_t}{A_t}$$

Where,$A_t$is total capital employed in period t.

Although ROCE is a widely used indicator of profitability, the ROCE for any yearcan give results that are significantly different from the IRR. This is primarilybecause ROCE is highly sensitive to the specific underlying accounting principles,while the IRR is much less so. In particular, the IRR is calculated from actual cashinflows and outflows each year. ROCE diverges from cash inflows and outflowsbecause of the spread of investment costs over a large number of periods(through depreciation) and because of the accounting principles of recognitionand accruals.In principle, ROCE can be calculated based on pre- or post-tax earnings. Using pre-tax earningsprovides a measure of total returns to capital employed, including those that are apportioned toequity-holders, debt-holders and government. Using post-tax earnings would provide a measure ofreturns to equity- and debt-holders only.

Nevertheless, the average ROCE over the period in question may be used as a proxy forthe IRR if each of the following conditions is met:

- the correct asset valuation is used (i.e. based on the value-to-the-owner principle)
- the accounts are fully articulated such that all changes in the book value of assets flow through the profit and loss account.

B) Return on Equity

ROCE can be decomposed into various components which themselves aresometimes used as measures of the profitability of an activity. In particular, EBITcan be decomposed into net earnings after taxes (Π), interest payments (I), andtax (T), while capital employed (A) can be decomposed into equity- and debtfundedcapital (E and D, respectively). ROCE can therefore bere-expressed as follows:where ROE is the return on equity (i.e. Π divided by E), another measure ofprofitability.

C) Return on Sales

ROCE can also be re-expressed as follows:

$$ROCE = \frac{EBIT}{Q} * \frac{A}{Q} ; = ROS * \frac{A}{Q}$$

where*Q*is sales (turnover) and *A* is total capital employed. ROS (the ratio ofearnings to sales) is another measure of profitability, which essentially measureshow profitable an activity's sales are from an operating perspective. The ROS measure eliminates the need toestimate the total capital employed. Hence, while its conceptual foundations maybe weaker than those of the IRR or the NPV, given that there is no direct linkbetween the ROS and a benchmark, the ROS has the advantage that it is ofteneasier and more convenient to obtain than the IRR, particularly in cases where it isdifficult to estimate the assets employed.

D) Gross Margins

Another proxy measure which is closely related to the ROS is gross margins,which can be obtained from the decomposition of ROS as follows:

$$ROS = \frac{EBIT}{Q} = \frac{Costofgoodssold}{Q} + \frac{CostofgoodssoldOther\ costs}{Q}$$

$$ROS = Gross\ Margins + \frac{Gross\ costs}{Q}$$

Where,*Q* is sales; the cost of goods sold usually includes direct costs such as rawmaterials or the wholesale costs of the goods; and other costs include overheadssuch as selling, and general and administrative expenses. Different companiesmay include different items in the category of 'cost of goods sold' in theiraccounts. Hence, before making comparisons of gross margins across companies, check to ensure that theclassification is consistent.

E) The Tobin's Q and The Market-To-Book Ratio

The Tobin's q is a market-based indicator of profitability. Market-based indicatorsessentially use valuations provided by the stock market. They are based on theassumption that stock markets operate in accordance with rational-pricing modelswhich suggest that the higher the expected stream of future returns, the higherthe market valuation of the business. In this way, the indicator providesinformation about the underlying returns that a company is expected to make —i.e. it provides a proxy for future private profitability. The Tobin's q is the market value ofa company's debt and equity, divided by the replacement value of the assets

$$Tobin's\ q = \frac{Market\ value\ of\ assets}{MEA\ value}$$

A closely related measure is the market-to-book ratio. This is the ratio of themarket value of a company to the book value of its common stock (i.e. equity):

$$Market - to - book\ ratio = \frac{Market\ value\ of\ assets}{Book\ value\ of\ equity}$$

Therefore, firms have an incentive to invest when the Tobin's q is greater than 1(i.e. when the value generated by the capital equipment is higher than the cost ofreplacing it) and will stop investment only when the ratio is less than 1 (i.e. whenthe value generated by the equipment is lower than its MEA value). When theratio is less than 1, it may be cheaper to acquire assets through a takeover than to buy new ones.

4.0 CONCLUSION

We conclude that the internal rate of return (IRR) and the net present value (NPV)are the conceptually correct and frequently used measures of profitability of an activity (aninvestment, a line of business, or a company). They take into account the inflows and outflows of an activity

overtime, and reflect the economic principle of time preference of money. There are other profitability measures, some of which can be used as proxy measures for theIRR and NPV in certain circumstances, such as *accounting ratios* (ROCE, ROE, return on sales, or ROS, and gross margins) and*market valuations* (the Tobin's q, the market-to-book ratio) based on investors' expectations of future returns.

5.0 SUMMARY

In this unit, we discuss thatprivate projects are usually basically assessed on the basis of financial criteria such as net present value (NPV), the benefit-cost ratio (BCR), internal rate of return (IRR), and/or modified internal rate of return (MIRR). Others proxy measures are return on capital employed, return on equity, return on sales, the Tobin's q among others.

6.0 TUTOR-MARKED ASSIGNMENTS

13. What is private profitability assessment?
14. Explain two main measures of assessing private profitability.
15. Discuss two proxy measures of assessing private profitability.

7.0 REFERENCES/FURTHER READINGS

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