



**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**SCHOOL OF BUSINESS AND HUMAN RESOURCE  
MANAGEMENT**

**COURSE CODE:TSM 303**

**COURSE TITLE:CONCEPT, DESIGN AND FEASIBILITY I**

**COURSE  
GUIDE**

**TSM 303**

**CONCEPT, DESIGN AND FEASIBILITY I**

Course Developer	Ayano D. A
Programme Leader	Dr. O. J. Onwe National Open University
Course Coordinator	Mrs. Caroline Aturu-Aghedo National Open University



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## **Introduction**

The fundamental aspect of any investment decision is profitability. Before embarking on any major business project, a study should be undertaken to determine the feasibility of such a project and the degree of risk associated with such an investment.

The main concern of feasibility study is a detailed estimate of the cost and the technical, commercial, management and financial aspects of the project. It is an aid to an investment decision-making.

### **Uses of Feasibility Studies**

1. It helps to ascertain whether or not a project is worth undertaking.
2. It is normally required to support an application for financial assistance.
3. It serves as an implementation guide to the project to which it relates.

The Contents of a Feasibility Report includes:

- A brief description of the project
- The project objective
- The economic and social justification for the project
- Organisation and management
- Technical and production considerations
- Demand and supply outlook
- Marketing strategies
- Financial projections and profitability
- Cost of project
- Financing plan
- Risk analysis.

## **What You Will Learn In the Course**

During this course, you will be learning about:

- How to start a business -Business plan
- Simple Cash Flow Forecasts
- Feasibility Studies
- Key Parts of Feasibility Report
- Project Financing and Associated Risks
- Project Cycle (with emphasis on the Financial and Economic Feasibility)
- Project Planning and Control



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- Financing of project- objectives of financial analysis,
  - i. Sources and uses of funds, Cash flow statements and working capital management,
  - ii. Financial cost and benefits analysis,
  - iii. Evolving of financial plan (budgeting),
  - iv. Techniques and tools of analysis
  - v. Breakeven Analysis
  - vi. Budgeting Techniques

#### **Course Aim and Objectives**

This course aims at:

- Knowing how to start a business -business plan
- Understanding simple cash flow forecasts
- Knowing how to write feasibility studies
- Stating Key Parts of feasibility report
- Understanding project financing and associated risks
- Understanding project cycle (with emphasis on the financial and economic feasibility)
- Project planning and control
- Financing of project- objectives of financial analysis
- Sources and uses of funds
- Cash flow statements and working capital management
- Financial cost and benefits analysis
- vii. Evolving of financial plan (budgeting)
- viii. Techniques and tools of analysis
- ix. Breakeven analysis
- x.** Budgeting techniques

When all the above aims are considered, we can conclude that the major aim of the course is to expose you to various methods and techniques of feasibility study.

### **Working through This Course**

For you to complete this course successfully, you are required to read the study units, reference books, and other resources that are related to the unit. Each unit of the course contains a Tutor-Marked Assignment.

The Tutor-Marked Assignment (TMA) is to be done immediately and submitted to your tutorial lecturer/course facilitator for assessment.

The medium to be used and the time to submit the TMA will be specified to you later. This course is a 2-credit course. As such you are expected to spend a minimum of two hours every week studying the course. You are expected to complete the entire course outline within a period of 18-25 weeks.

### **Course Evaluation**

As stated before every unit of this course has an assignment attached to it. You are required to keep an assignment file. After every unit, the assignment should be done. At the end of the course, the evaluation shall be as follows:





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Assignment	–	30 %
Examination	–	70%
Total	=	100%

Out of all the assignment you will do, each one shall be marked and converted to 3%. At the end, the best 10 shall be selected so as to make up to 30%. The examination at the end of the course shall cover all aspects of the course.

#### **Course Units**

In this course, we have discussed the topic of the course content entitled concept, design and feasibility under different topics. Based on this, the following units have been designed:

**Module 1**

Unit 1	How to Start A Business -Business Plan
Unit 2	Simple Cash Flow Forecasts
Unit 3	Feasibility Studies
Unit 4	Key Parts of Feasibility Report
Unit 5	Project Financing and Associated Risks

**Module 2**

Unit 1	Project Cycle (With Emphasis on the Financial and Economic Feasibility)
Unit 2	Project Planning and Control
Unit 3	Financing of project- objectives of financial analysis,
Unit 4	Sources and uses of funds,
Unit 5	Cash flow statements and working capital management,



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**Module 3**

Unit 1	Financial cost and benefits analysis,
Unit 2	Evolving of financial plan (budgeting),
Unit 3	Techniques and tools of analysis
Unit 4	Breakeven analysis
Unit 5	Budgeting Techniques

These units must be treated sequentially; as a logical link exists in the arrangement. Every previous unit lays a foundation for subsequent ones. A maximum period of one week is required for every unit.

### **Reference Materials and Other Sources**

As was earlier mentioned, materials relevant to the course include not only the ones below but also others that you can lay your hands on. But for now, the following references are recommended.

Odufalu, O. (2000). *“The Principles and Techniques of Project Analysis and Evaluation”*.

Themistocleous G, Wearne SH. Project management topic coverage in Journal of Project Management. 2000; 18:7-11.

Samuel, Eilon, “What is a Decision?” *Management Science* (December 1969): B-172.

International labour organization, (1992). *How to Start a Small Business, “A manual for community workers assisting persons with disabilities”* by Lena Karlsson.

John, A. (1985). *“Effective Decision-Making”: A guide to thinking for management success*.

Jonathan, A. O. Ifechukwu. (2006). *How to prepare a feasibility report and establish your own business*.

Nwoye, Small Business Enterprise.1994.

### **Presentation Schedule**

Specific dates for particular activities, such as submission of assignment, tutorial schedules and examination dates shall be made available to you on a later date. This will enable you plan your activities in the same line. The method of submitting your assignment and receiving other course materials shall be agreed upon on a later date.



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You should endeavour not to be falling behind the schedule whenever it is given.

#### **Conclusion**

By the time you exhaust this course, you will find it useful to set up and manage a business through adequate feasibility studies.

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## **MODULE 1**

Unit 1	How to Start A Business - Business Plan
Unit 2	Simple Cash Flow Forecasts
Unit 3	Feasibility Studies
Unit 4	Key Parts of Feasibility Report
Unit 5	Project Financing and Associated Risks

### **UNIT 1    HOW TO START A BUSINESS-BUSINESS PLAN**

#### **CONTENTS**

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Writing a Business Plan
3.1.1	Clarity
3.1.2	Brevity
3.1.3	Logic
3.1.4	Truth
3.1.5	Figures
3.2	Designing a Business Plan
3.3	Deciding How much to Write
3.4	Getting Down to it
3.5	How do I Set About it?
3.6	Tackling Each Section
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Readings

#### **1.0    INTRODUCTION**

Starting a new business venture is like going into a tropical forest on a treasure hunt. There are rewards to be won, both in material wealth and personal satisfaction, but there are dangers lurking and you can easily lose your way.

Before taking the crucial decision to go into business you have to weigh your personal circumstances as to your ability, training, experience, motivation and financial capability. After weighing these factors and you think you can go into business of your own, by all means, go ahead. In reaching this important decision, however, there are other very

important factors you have to consider. In particular, you will need to ask yourself the following questions:

1. Have I discovered a business opportunity? That is, have I discovered a product or service for which there is enough market?
2. Do I have the ability and experience to exploit the opportunity? Or can I acquire the ability and experience? Never get discouraged if you think you do not have enough experience. If you have enough motivation, you will win as long as you are prepared to start on a small scale and acquire experience through practice.
3. Do I have the necessary capital? Or can I raise the necessary capital?
4. What form of business organization do I want to have?
5. How will I manage the business?
6. Where shall I locate the business?
7. Have I done a feasibility study to satisfy myself that there is enough market for the business and to examine more deeply the requirements of the business? Does the feasibility report indicate the business will be profitable?
8. Have I considered the legal requirements, if any, to be met before the commencement of the business?
9. When will the business operation begin?

Your efforts at answering the above questions will force you to plan. Can you imagine any business that has been undertaken successfully without proper planning? There is this dictum that ‘when you fail to plan you plan to fail’. Is a must you plan; but is left for you if to plan for failure or success in your dream business? To be successful in your business you must learn one important task, PLANNING. Without proper planning, the business is bound to run into serious trouble and may fail if corrective steps are not taken in time.

Before beginning work on your business plan, you will do well to ask yourself two vital questions:

- What do you really want out of the business?
- What feature of your product or service will give you the all important edge over your competitors?

Is your product or service:

1. An entirely new idea?
2. An improved version of something that already exists?
3. Cheaper than the others?
4. More reliable as to delivery or after-sales service?
5. More readily available to local customers?

## **2.0 OBJECTIVES**

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

- explain the basic concept of business plan
- explain the simple cash flow forecast
- explain how not to write a business plan –or run a business
- explain how to maintain a business plan.

## **3.0 MAIN CONTENT**

### **3.1 Writing a Business Plan**

Business plans are required whenever money is to be raised, whether from a bank, a finance house, or a provider of equity capital. To you, your business is of supreme interest and importance; to the bank or fund manager, your plan is but one of many that is received. So you must win this person's approval and keep his or her interest. To do this:

- Be clear
- Be brief
- Be logical
- Be truthful
- Back up words with figures wherever possible.

#### **3.1.1 Clarity**

The person reading your business plan is busy, often has other issues to deal with, and is consciously or unconsciously judging you by the way in which you express yourself. Therefore:

- Keep your language simple
- Avoid trying to get too many ideas into one sentence
- Let one sentence follow on logically from the last
- Go easy on the adjectives
- Tabulate wherever appropriate.

#### **3.1.2 Brevity**

If the banker or manager gets bored while reading your stuff, you are unlikely to get the sympathetic hearing you deserve. So prune and prune again, leaving only the essentials of what your reader ought to be told. In-depth descriptions are out.

#### **3.1.3 Logic**

The facts and ideas you present will be easier to take in and make more impact if they follow one another in a logical sequence. Avoid a series of inconsequential paragraphs, however, well phrased. Also, make sure that what you say under one heading chimes in with all you have said elsewhere.

### **3.1.4 Truth**

Do not overstate your case.

### **3.1.5 Figures**

The banker or investor reading your plan is numerate, thinking in terms of numbers. Words will not impress a banker unless they are backed by figures that you have made as precise as possible. So try to quantify wherever you can.

## **3.2 Designing the Business Plan**

The layout of your business plan can help greatly in keeping the reader interested. Above all, the information you give must follow a logical pattern. You could present your material in the sequence shown here, using headings, so that the reader can survey your plan and navigate without difficulty.

1. A brief statement of your objectives.
2. Your assessment of the market you plan to enter.
3. The skill, experience and finance you will bring to it.
4. The particular benefits of the product or service to your customers.
5. How you will set up the business.
6. Your financial targets.
7. The money you are asking for and how it will be used.
8. The long-term view.
9. Appendices to back up previous statements, including especially the cash flow and other financial projections.
10. History of the business (where applicable).

The above list can be added to, of course, if the people who will read your business plan have a special interest to which you should address yourself. For instance, public authorities are concerned to know the effect on local unemployment: write a special and prominent section to tell them about it.

## **3.3 Deciding How Much to Write**

In all business plans something, however brief, should be noted on each of the items listed above. How much you put into each section should be in proportion to the size and scope of your project as the reader of your plan will see it. A busy bank official will not want to read through pages of material if he is being asked for no more than a few hundred pounds. On the other hand, he will not be impressed if, when asked to lend £100,000, he is given only a sentence or two on the aspect that is of interest most.

### **3.4 Getting Down to it**

Careful writing of your business plan will give you a better insight into your own business.

You have a marvelous project; you have a shrewd idea that there is a market for it; you have obtained a good deal of advice from experts and have done sums to calculate your hoped-for profits, your cash flow and the money you need to raise. So, when you get the finance, you will be ready to go. Or so you believe! But it is odds-on you still have home work to do. Now is the time to do it.

‘Writing’, said Sir Francis Bacon, ‘makes an exact man’. There is nothing so effective in testing the logic and coherence of your ideas as writing them out –in full. As the future of your business depends in large part on your ideas working in a logical and coherent way, now is the time to subject them to test

### **3.5 How Do I Set About It?**

Taking the sections numbered opposite one by one, make notes under each heading of all you have done or expect to do. For example, regarding Section 2, what do you really know about the market you want to enter? Have you done enough market research? Who will be your customers? How many will there be? How will you contact them? How will you get your goods to them?

Or, when it comes to Section 5, have you a clear, concrete picture of what you will actually do to ‘get the show on the road’?

Write it all out! Perhaps you would like to adopt the following method: taking a large sheet of paper for each of the above sections, note down the facts relevant to each of them; then sort them, test for truth and coherence and arrange into a logical pattern.

You will prune hard when you come to write the document itself. In the meantime, you will have organized your ideas, you will have noticed the

gaps and weaknesses, and the business, and the business is bound to go the better for it.

### **3.6 Tackling Each Section**

#### **1. The Brief Statement**

This should be to point. Just something to show the reader what your plan is all about. Say what you do in one sentence. In a second sentence, state how much money you want and what you want it for.

#### **2. The Market**

When you come to the main body of your document, start with the section that is most likely to impress your reader. The majority of people lending money believe that what makes for success in business is finding and exploiting a large enough market. So, as a rule, the 'market section' should be the one with which you lead off.

Though your product may be the best since the invention of the motor car and you may have the talents of a Henry Ford, you will get nowhere if there is no call for your brainchild or you lack the means of projecting your product into the market. The person reading your plan will know this only too well, and will want to find out whether you are aware of these facts and how well you have done your home work. Your market research is crucial.

Note that where figures are given, and they should be given freely, the authority for the figures should be quoted. If your figures can be checked, this will promote confidence.

#### **3. The Skills, Experience and Resources of the Persons involved**

A lender or investor will want to know the track record of the person to whom his or her own or clients' money is to be entrusted. Therefore, you must give a fairly full account of your own business career and those of your co-ordinators or partners. School and academic histories are hardly relevant. Past achievements and technical qualifications, on the other hand, are.

Of almost equal importance is the degree of your financial investment. You cannot expect others to risk money in an enterprise to which the founders themselves are not financially committed in a big way.

#### **4. The Benefits of Your Product**



This is the most difficult part about which to comment because it is the section in which you are likely to wax most enthusiastic. Human progress depends on new ideas, and people with good ones need all the support they can get. That been said, you must face the fact that only a minority of innovations can be made commercially viable. Your banker or financier has probably seen hundreds of absolutely brilliant ideas come to naught, and for all kinds of reasons. So this is the section you will have to write most soberly.

A famous American writer – a writer, not a businessman – once said that if you made a better mousetrap, the entire world would beat a path to your door. This is just not true. Any successful business person could have told him that simply making a better product is only one step on the way to success, and not even the first or the most important step.

Do not get too disheartened. You have, you believe, a first-class product and, as you demonstrated (under number 2, above), the market for it is there. What you must do now is to persuade your reader that the product is a good one and that it will have the edge to help you exploit the opportunities set out under number 2.

Stick firmly to hard fact! ‘Puff’ sentences, such as ‘This is the best widget-grinder on the market and will be the cheapest too’, cut very little ice. Show, with figures, why it is the best and why, despite this, it is not the most expensive. If you have some independent test results, say so, and give at least a summary of them in an appendix. A few genuine figures are worth a page of adjectives, on which, as was stated earlier, you must go easy.

Information that could be included in this section:

- a brief description of the product or idea
- how it works
- why it is better than the rivals
- any independent appraisal (with details in an appendix).

## **5. The Method**

By this time your reader will have clear idea of your market, your skills and the customer benefits of your product. What he or she wants to know is whether you are going to set about things in a sensible and workmanlike manner. Tell your reader what he or she should know in terms that are as concrete as possible.

- a) First of all, how do you propose to market the product or service? Will you have your own sales force? What will you do about

publicity and advertisement? How will you 'target' your sales drive? Under what terms will you sell? When will you be starting on all this? Give a firm time schedule, if possible.

- b) It will promote confidence if you outline your 'management structure'. If you have partners or colleagues, who will be responsible for what? How do you intend to keep the various sections in touch with one another? Will you have management meeting once in a week? Once a month? Or only when there is a desperate crisis? What about keeping employees abreast of what is going on and what is expected of them?
- c) Outline the production methods you will adopt at the start of the project. Write something, briefly, about the premises you will use. A sentence, or possibly two, will tell of the plant and machinery. You may need a workforce. State how many people you will need at the beginning and later, as sales increase. What will be the capacity of the initial set up?
- d) The office is your next concern. As a skilled engineer or a keen sales person, you may be impatient of all the paper work. However, to convince your reader that your business will not descend into chaos or grind to a halt, tell him or her who will see to it that it does not. Who will make sure that the letters are answered in your absence. Who will look after the books? Answer the phone? Process orders? Invoices? Who will chase up debtors? Have you assessed the amount of work which will need to be done in this department?

Your reader will also want to know how you will control and monitor the business financially. The smallest business needs to know at all times what its cash position is. As soon as there are those who owe you money, or to whom you owe money, it will be necessary to keep regular check. Your banker or your investor will know that many an otherwise good business has come to grief through lack of elementary financial controls. Ensure not only that you have made the necessary arrangements, but that your investor knows you have given this aspect proper regard. Any good accountant should be happy to advise you.

### **The Long-Term View**

So far, so good, you have explained how you will get your project off the ground and how it will run during the start up period. Now the banker or investor will want to know how he or she stands for the future. Some enterprises are essentially short term. Some should continue to be very profitable over a longer period. Some will be slow-growing, and their financial needs can be met out of profits. Others will have to

accelerate fast, and they will need further injections of capital on a pre-planned basis. Your financial banker will want to know your thoughts on all these points.

If yours is a project to exploit some ‘trendy’ idea, the banker will expect some assurance that, if the fashion were to change, he or she could be paid out of ready money and not be locked into unamortized fixed assets, i.e., fixed assets whose cost has not yet been recovered out of profits and which would be difficult to sell. In general, the banker should be told how you see the market over five years, and in the long-term. Also, what you propose to do about potential competition.

### **Use of the funds**

Now that your reader knows that you have a good product, that there is a market for it, and that you know how to run the business in an efficient way, you should explain, in fair detail, why you need his or her money and how you will spend it.

Emphasize how much money you and your colleagues are investing. No one is going to risk money on your project if you are not substantially committed.

Having added up the sums you are putting in and all that you are hoping to raise, list the items you will be spending the money on, such as:

- patents
- land and buildings (give some details)
- plant and equipment (specify major items)
- cost of publicity for the initial launch
- working capital (reference to cash flow forecasts)
- reserve for contingencies.

### **Financial Targets**

Although your hopes and plans for financing your business will be set out in all the cash flow forecast, etc, which you will attach as appendices, it will be helpful if you give a brief summary now of the important points. No matter how small the business, you will be expected to show:

- the expected turnover for the first year
- the expected net profit for the first year
- how much of the loan will be paid off in one year
- when you expect to pay off the loan entirely

- what you hope for in the second year (when payments from the business start-up allowance, if any, will no longer be coming in).

You do not have to show that the business will make a profit in the first year. Your banker knows that many businesses make a loss initially and still go on to succeed. If you show that you can expect to achieve profit in the long term, your banker should be prepared to go along with this.

However, if you are raising equity capital, there are other considerations. Most equity investors expect to be with you a long time. They are interested in capital gain and, if available, dividends. The additional information they will want is:

- the rate at which you expect profit to grow
- what your dividend policy will be
- what you and the other directors will be taking out of the business before the equity holders' share in the profits
- what plan or ambition you have (if any) to sell out, to buy them out, or to go on the AIM (Alternative Investment Market), a junior branch of the Stock Exchange.

## **The Appendices**

What you have said so far should have told readers all about your project. You have now to add documentation to convince him or her that you have done your homework properly and that you can show good evidence for what you have said. Last, and most important, will be the detailed financial forecast. This will vary from the relatively simple cash flow forecast on a form supplied by your bank to an elaborate 'business model' prepared by a professional accountant.

The financial projections are the real meat of the whole business plan. A great deal of information should be given, especially in the cash flow forecast.

Other appendices could be copies of any documents that will support what you have said previously. They might include:

- accurate summaries of any market research, either your own or research that has been professionally carried out
- photocopies of local newspaper articles describing a need for a service you propose to provide
- picture of your product or products
- copies of your leaflets or other promotional literature
- the results of any testing of your product, especially if it has been done by an independent organization.

The general outline so far given is intended to guide you, for those seeking funds for a new enterprise. If you want finance to expand an existing business or to take over an existing shop, the principles will remain the same, but you will need to write an additional paragraph or pages, preferably at the beginning of your business plan, to do with:

### **The History of the Business**

This section should be brief, factual, and based on the audited trading results. At least three years' results should be shown, if possible, as well as the last balance sheet. Reference may be made to such fuller comment, explanation and plans for change as may be given in later pages, e.g. under 'Marketing' or 'Management'.

The history should also tell of any major changes in ownership or management of significant market alterations trends –in other words, it should mention any important happening that has affected the business over the past few years.

## **4.0 CONCLUSION**

In conclusion, we have seen in our discussion of basic concept of business plan that your plan is but one of many that is received. So you must win financial provider/ bank an approval and keep his or her interest. To do this, you need to be clear; brief, logical, truthful and back up words with figures wherever possible and also know the simple cash flow forecast. Thus, this chapter taught us how to write a business plan and run a business; as well as maintain a business plan.

## **5.0 SUMMARY**

In the course of this study, we were able to discuss how to plan, write and design a business. Also, the chapter discussed the market and use of funds and other sections and aspects of a business plan.

## **6.0 TUTOR-MARKED ASSIGNMENT**

How can you establish a desire business of your own with the help of business plan?

## **7.0 REFERENCES/FURTHER READINGS**

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## **UNIT 2      SIMPLE CASH FLOW FORECASTS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 What is Cash Flow Forecast?
  - 3.2 Is a Cash Flow Forecast of Any Real Use?
  - 3.3 Principles to Observe When Filling in a Simple Cash Flow Form
  - 3.4 The Break-Even Analysis
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

To those who are venturing into business for the first time, the prospect of having to draw up a cash flow forecast can be intimidating; but the banks will demand for this when a loan is sought for even the smallest of one-man business. This is because they believe it will give them at least some idea as to whether and when they are likely to get their money back.

### **2.0 OBJECTIVES**

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

- forecast cash flow
- produce a sample of break-even analysis.

### **3.0 MAIN CONTENT**

#### **3.1 What is Cash Flow Forecast?**

The cash flow forecast sets out, usually in monthly columns, the sums you expect to receive by way of sales, Business Start-up Allowance, etc, and compares this inflow of money with the payments you will be making for stock, materials, overheads, equipment, and the money you will have to take out of the business for living expenses.

It is not a forecast of probability of business, but merely a guess as to whether, in the short term, more cash will come in than go out. That is not necessarily the same as profitability. On the one hand, although your

profit margins might not be adequate to cover overheads and write off the cost of equipment, your cash flow could be good enough to pay the bank back its money while you were losing yours. On the other hand, there are profitable businesses (i.e. their net assets are growing nicely) that are called 'cash hungry'. They may be making fine profits, but all the cash they take in, and more, is needed to increase stock or give credit to an ever larger number of customers. So the bank will call a halt, and they may have to close their business, despite its underlying profitability.

### **3.2 Is a Cash Flow Forecast of Any Real Use?**

A cash flow forecast that is badly drawn up is clearly of little use. It serves merely as a snare and delusion. Unfortunately, the project figures in your forecast will depend on the reliability of your crystal ball in foretelling your sales figures. You may improve the accuracy of those figures by conscientious market research or by! peering into an uncertain future.

However, if the sales figures appear reasonable and conservative, and if the cash flow forecast has been well and logically drawn up, the bank will be able to 'take a view' as to whether it can lend the money (and get it back again without having to sell up your house and furniture- a step even the toughest bank manager is loth to take).

To persuade the bank or building society to lend you the money you need is, of course, the primary purpose of a cash flow forecast. It has, however, some other very important uses.

Actually producing a well-thought-out forecast fulfils the same function as writing a well-prepared business plan. It will sharpen up your ideas. It will make you aware of the effect on your bank balance of the decisions you take in your planning, e.g. of the amounts to be spent on advertising, your terms of sale (very important for cash flow), whether or not to buy your own transport, etc. Giving thought to your cash flow is a very worthwhile exercise. Try drawing up several forecasts, each based on rather different assumptions of sales and expenditure. The few hours you spend could prove the most profitable of your life!

Even the smallest business is more likely to do well if its owner keeps a close eye on its financial progress, comparing what is hoped and planned for with what is actually happening. In business jargon this is called 'budgetary control'. In your cash flow forecast you will have an invaluable little tool when you come to set up your own small-scale budgetary control. So don't tear it up once the bank has seen it. Most of the banks appreciate the value of their cash flow sheets as budgetary



control documents and provide adjoining columns for ‘forecast’ and actual’. If, every month and immediately after the month-end, you fill in all the figures in the ‘actual’ column, you will get a quick indication of anything that is going wrong, together with strong hints as to target any remedial action.

### **3.3 Principles to Observe when Filling in a Simple Cash Flow Form**

- Enter the more certain figures first.
- Make every entry in the month in which cash and cheques are handed over.
- All entries must be inclusive of VAT where applicable.
- Start by entering those payments of which you are certain (or almost certain):
  - The rent- in the actual months when it must be paid
  - The rates- for each month when they must be paid
- HP payments on any vehicles or machinery
- Loan repayments on any fixed-term loan you have agreed or hope to agree
- Wages of any regular employees
- The sums you will have to draw from the business to live on
- Any other payments you expect to have to make if you know the amounts
- Now also enter the sure regular receipts, such as:
  - Business Start-up Allowance payments
  - Rents from any sub-let.

The next items are more difficult. They are overhead payments, the amounts of which are not yet certain because the invoices have not been received. These will include:

- Gas and electricity bills
- Telephone bills
- Advertising and publicity costs
- Petrol and other motor expenses
- Stationary and printing
- Postage and packaging
- Insurances
- Repairs and renewals
- Contingencies; depending on the nature of the business.

These items cannot be predicted with any great accuracy but, if you have done your homework, you should be able to make reasonable estimates. Enter them, of course, for the months when you will have to pay them. 'Repairs and renewals' are a special case. They are by their very nature uncertain, both as to amount and timing. Make a good guess as to the yearly cost and divide this into four quarterly payments.

The next thing to do is to enter the initial receipts and payments- those once-and-for-all transactions that get you started. The receipts could include:

- Fixed loans from the bank
- Loans from family or friends
- Money of your own which you pay into the business account after the date of start-up
- Grants.

The payment could include:

- Capital payment for the lease
- Machinery and equipment
- Initial licence fees
- Legal fees
- Installation costs
- Office equipment
- Starting cost
- Advertising to launch the product.

Remember that the cash flow forecast is deemed to start on a specific day-usually the first of the month. Any payments made or moneys received before that date must be ignored. You are writing a cash flow, not a profit and loss account.

Many of these initial costs will be paid in the first month and should be entered in the appropriate spaces for that month. However, you may get extended credit for, say, 30 days or six weeks for some items. Enter them for the months in which they will actually be paid.

Most of your figures will have been entered now. But you will have the difficult part to do. You must tackle the sales side. This is a matter of putting hard figures to the faith you have in your product. You know in your bone that the product or service will sell. But how well? And how soon will the money start to come in? You will have some market research even if, as a potential window cleaner, you have done nothing more than call on the neighbors to find out how many will pay to have their windows cleaned. Use all the information you have gleaned about

your market; link this with the amount of time you will be able to devote to selling, and you should be able to make some sort of educated guess at the turnover you can expect once you have got going properly.

### **3.4 The Break-Even Analysis**

The cash flow forecast that you have just drawn up is designed to assure a bank manager or other lender that he is likely to get his money back. It is also, as explained above, a fine tool for helping you to understand your business better. Even more useful, however, is what is called a 'break even analysis' - a means of determining how much you must sell in order to meet your commitments.

#### **To Produce a Sample Break-Even Analysis**

Add up all your overheads and the payments you will have to make whether you produce anything or not. Included will be rent, rates, insurance, lighting and heating, etc; also office staff wages, the basic wages, production workers, interest on bank overdrafts or loans, sales, costs and, of course, depreciation.

Work out the cost of making one article, excluding all the above overheads, etc. included in this 'marginal cost', as it is called, will be raw materials, and those wages that are directly related to production, i.e. piece work or bonus payments and overtime.

Settle on your selling price (which should be the highest your market will stand).

Work out the difference between the cost (2) and the selling price to determine your gross profit per unit.

Now work out how many units you will have to sell to meet your commitments before you make a penny for yourself.

### **4.0 CONCLUSION**

A cash flow forecast is probably as complicated a production as can be expected from someone lacking professional training. It will just about do when a loan of up to two-or three-thousand pounds is wanted. But if tens of thousands of pounds are required, then a more sophisticated document will have to be prepared, preferably a full business model, with forecast profit and loss accounts and balance sheets. This is a task that should be put into the hand of professionally qualified accountants, and is not covered here.

### **5.0 SUMMARY**

In the course of this study we were able to discuss the meaning of cash flow forecast and its various uses as well the principle to adopt while applying cash flow forecast. And finally, the study discussed the break-even analysis.

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. What do you understand by break-even analysis?
2. Discuss the principles guiding the application of cash flow forecast?

## **7.0 REFERENCES/FURTHER READINGS**

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## **UNIT 3      FEASIBILITY STUDIES**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 What is a Feasibility Report?
  - 3.2 How to Collect Information for Writing Your Feasibility Report.
  - 3.3 The Kind of Information Needed for a Feasibility Report
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

The fundamental aspect of any investment decision is profitability. Before embarking on any major business project, a study should be undertaken to determine the feasibility of such a project and the degree of risk associated with such an investment.

The main concern of feasibility study is a detailed estimate of the cost and the technical, commercial, management and financial aspects of the project. It is an aid to an investment decision-making.

#### Uses of Feasibility Studies

- It helps to ascertain whether or not a project is worth undertaking.
- It is normally required to support an application for financial assistance.
- It serves as an implementation guide to the project to which it relates.

#### The Contents of a Feasibility Report

- A brief description of the project
- The project objective
- The economic and social justification for the project
- Organization and management
- Technical and production considerations
- Demand and supply outlook
- Marketing strategies
- Financial projections and profitability

- Cost of project
- Financing plan
- Risk analysis.

## **2.0 OBJECTIVES**

At the end of this unit, student will understand what feasibility studies is all about and will be able to conduct a good feasibility study for the success of a business.

## **3.0 MAIN CONTENT**

### **3.1 What is a Feasibility Report?**

Put in a very simple language, a feasibility report tells you whether a business plan will succeed or fail. In other words, the report concerns itself with determining whether the business you plan to do will be profitable. If the report indicates that the business cannot succeed then you must think of another business plan.

Such a report, no matter how elementary, is very important and should be prepared by anybody who wants to start a new business or expand an existing one. If you happen to go to any bank or any institution giving loans to businessmen, you will probably hear the loan officer telling you to go and bring a feasibility report or business plan which will show him whether there is a market for your product, whether you can manage the business and the financial implications of the proposal and whether or not the business proposal will be profitable.

A feasibility report helps you not only to make a decision whether to invest or not but also it helps you to raise much capital for your business.

A feasibility report also serves as a basis for measuring the performance of your new business.

### **3.2 How to Collect Information for Writing Your Feasibility Report**

In our country where there is poor record keeping and poor dissemination or publication of information, collecting information can be challenging and sometimes frustrating. But you should not be intimidated by this challenge.

Without information (or data, to use a technical jargon) it will be very difficult for you to determine what kind of information you need so as to prevent you from collecting useless material.

### **3.3 The Kind of Information Needed for a Feasibility Report**

The following are the major kinds of information a person doing feasibility study will need:

#### **1. Market Information**

You should try to answer the following questions:

Who are the major consumers of your product?

Where are they? What is their purchasing power?

What is the competition? How many competitive businesses are in the market? Where are they located? What are their practices and policies? Their pricing policies? What is total known or estimated volume of competitive business within the geographical area in which you want to do the business? What are the channels of distribution? What kind of advertising and sales promotion do the competitors do? What are the sources of raw materials and their cost?

You should study business directories, industrial directories, telephone directories and any other relevant directories to find out who your competitors are and where they are located. You can also get information on your competitors from other public sources you can think of.

#### **2. Logistics Information**

Here you will be concerned with identifying the forms of transport available and their cost. You should also think about possible locations for your business and the comparative costs of the alternative locations. Are there any custom duties or excise duties to be paid?

It is important to note that location selection involves different factors for different kinds of businesses. For example, some of the factors you consider when trying to decide where to locate a factory are the following:

- Nearness to the market
- Sources of raw materials
- Availability of shipping facilities
- Availability of public utilities like electricity, water, telephone, etc.

- Availability of financial institutions like banks
- Availability of labour
- Availability of housing and so on.

You have to consider each factor in relation to your proposed location and determine to what extent it is going to affect the cost of your operation. If the raw materials are bulky and transporting them might be costly you should consider sitting your factory near the area where the raw materials are available. If the consumers of the products are concentrated in a certain geographical area or areas, you have to weigh the costs of transporting the finished goods to the market where your customers are. You should weigh the financial implications of each factor and compare the costs of alternative locations.

Then, site your project at the location which gives you maximum comparative advantage. Remember that you are in business to make profit. Therefore, site your project in a location that will enable you make the desired profit.

If you are proposing a wholesale business it will be wise to have the location near the center of your customer population. If such a business is in Lagos, for example, a location in Lagos Island will be quite satisfactory. Retailers can come to your warehouse easily to collect their supplies.

If you are proposing retail business its location is critical for success. It must be near the centre of where your customers are concentrated. Alternatively, it must be located in a high-foot traffic area where so many people pass-by to be able to notice and patronize your shop. You should take into consideration the age group of the population in the area where the shop is to be located, the group's income level, and the group's buying habits. You should try to match the shop's products, image, price class, and mode of operation.

If you are proposing a service business you have to determine whether visits by customers or clients are necessary. If so, you have to make sure that facilities for customer comfort are adequate. The location must also be consistent with the type of customers or clients you want and its habits in buying the service. You have to consider the need for efficient public utilities.

We have discussed location at length because of its importance. Location is very important for success. It can make or mar a business.



### **3. Information on Manpower Requirements**

You should gather information on the kind and grade of employees the business may require and their pay.

### **4. Information on Capital Requirements**

Kind of machines and equipment needed? Any building necessary? Any land acquisition necessary and the cost?

### **5. Legal Requirements**

You will need a lawyer if you want to operate the business as a partnership or as a limited liability company. You will have to complete registration formalities if you want to operate the business under a name other than your own.

### **6. Bankers' or Lenders Requirements**

This is the last but not the least. You must get in touch with the bank or financial institution or ministry to which you may intend to approach for a loan to finance the business. You have to find out their loan requirements so that you can present your loan request in the form acceptable to them.

## **3.4 Collecting the Information You Need**

You can collect the information you need by a combination of the following methods:

### **1. Observation**

Observation involves recognizing and noting people, objects and events rather than asking people to give you information. For example, instead of asking consumers what kind of shoes they buy you go to the markets or shops where people are buying shoes and observe what kind of shoes are bought and by whom. If you want to know what kind of people patronize certain types of hotels and restaurants, you visit the hotel and restaurants and observe things for yourself.

Visit the places where your existing or prospective competitors are doing business and collect as much information as you can by observation. You can go there as ordinary customer and this is perfectly alright. Make as many mental notes as you can and put your observation in writing as soon as you leave the scene.

## **2. Questions**

This is called the questionnaire method. You must learn to ask questions to get information on the market for the product, logistics, manpower requirements, and capital requirements. You can put these questions either verbally or in writing depending on the situation. You must determine who you are going to ask the questions from, customers, suppliers, competitors, government officials etc. For example, if you cannot visit the supplier of the machine you need, you can write him and ask him to give a quotation covering the cost of the machines, and their transportation to intended site. You can go to customs and find out whether there are import duties if the machines are to be imported.

All these mean you must come out and visit places and offices where you can get information in all the areas where information is needed. In this area, you must demonstrate your own creativity and ingenuity, for research is, after all, a creative task.

## **3. Library Research**

To the uninitiated, going to the library is intimidating. Library research is easy and I will show you how.

Before you go into the library make sure you know what you are looking for. There are librarians and library clerks always ready to help you in any good and well managed library. If you are looking for information on imports of certain commodity in this country, say cars, request the librarian to help you locate any publication, which will give you information on the amount of cars imported into this country. The librarian can collect some copies of annual abstract of statistics and Nigeria Trade Summary. Go through them patiently and painstakingly and collect the information you need. You can do the same on any other issues about which you want to do any other research. Be humble and tell the librarian you are new to the library and you need help on how to use the library.

## **4. Research on the Internet**

You can also do research on the internet. The internet is the world largest library. You can collect information on any subject on the internet. All you need to do is to know what you are looking for and how to browse on the internet.

Once you have collected all the information needed through observation, use of questionnaires and through reading of publications either in the library, the internet or elsewhere you are ready to begin the writing of

your report. Before you start writing, however, you must make sure that you have organized the information you have collected. Organize them in a file or two as the case may be.

#### **4.0 CONCLUSION**

In conclusion, collection of information can be so easy or complicated depending on how you handle it and your professional capability. And the information gotten as a long way to affect your feasibility report. It is of importance to get the right information, in case of any complication, contact your consultant.

#### **5.0 SUMMARY**

This study discussed the meaning of and how to gather information for a feasibility report, as well as relevant information applicable to feasibility report.

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. What do you understand by feasibility report?
2. Discuss the various methods of gathering information to be used in a feasibility report?

#### **7.0 REFERENCES/FURTHER READINGS**

Jonathan A. O. Ifechukwu, (2006). *How to Prepare a Feasibility Report and Establish Your Own Business*.

## **UNIT 4      KEY PARTS OF A FEASIBILITY REPORT**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Features of a Feasibility Report
  - 3.2 Profitability Analysis and Evaluation of the Project
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

Now that you have mastered how you can identify a business opportunity and how you can gather the required information for writing a feasibility report, you are now set for the next major aspect of feasibility study-writing the report. As you have seen by now, I have tried to remove as much technical jargon as possible that baffles the uninitiated to show you that there is no mystery about carrying out a feasibility study and writing report. One critical requirement, however, is that the study must be logically and carefully organized and painstakingly done.

### **2.0 OBJECTIVES**

At the end of this unit, the student should be able to discuss the basic features of a feasibility report and how they are being carried out.

### **3.0 MAIN CONTENT**

#### **3.1 Features of a Feasibility Report**

The major features or parts of a feasibility report can be outlined as follows:

- the product
- the market for the product
- the management team
- the production process and the production plan
- the marketing plan
- manpower requirements
- estimated capital expenditure
- estimated working capital

- cash budget
- projected income statement
- projected balance sheet
- profitability analysis and evaluation of the project.

## **1. The Product**

Give a brief and clear description of the nature of the product or service you are talking about. If it is a food product, give a clear description of what exactly it is.

## **2. The Market**

Here you give an account of the nature and size of the market for the proposed product or service. You must indicate here how you did the market study. With the information you collected about the market you can now make your forecast. The market forecast is your estimate of the total size of the market and the estimate of your share of the market. Your market share simply means the proportion of the total market (for the particular product or service) which you hope to control if you establish the business.

Your share of the market becomes your sales forecast. The sales forecast is very necessary because such important areas of decision making like production, planning for plant and equipment, manpower requirements, raw material purchases, advertising and cash flow needs depend on your estimate of sales. Nothing happens without sales. Unless there is sufficient market for your product or service, it will be a waste of money and effort to establish the business.

### **To Estimate the Market You Have to Determine**

The number of competitors in the industry and what part or proportion of the market will be left for you after the competitors have got their own market share.

You can estimate the market in a number of ways. Perhaps, one of the most common approaches is to estimate the number of families using your product in the geographical area where you want to market the product and multiply the number by their estimated annual expenditure for your kind of product per family.

To determine who competitors are is quite easy. Check a business or industrial directory and identify your competitors. You can also undertake a tour of the trade area of your interest to observe things for yourself. You can also ask people who you think can supply you with

the necessary information. Visit the ministry of trade and industry. Your banker may also know who your competitors are. Talk to existing retailers and wholesalers of the product. Visit the chamber of commerce and any manufacturers association near you. Explore all sources of information earlier discussed and any new ones you can think of.

### **Once You have the Two Figures, namely**

- the estimated market for the product in the industry and
- the number of competitors (including, of course, yourself) you can then estimate your market share.

Let us illustrate. Let us take, for example, that there are 50,000 families in the geographical area where you want to sell your product. We assume each of the families spends N200.00 a year on your proposed product. Let us assume also that there are five competitors (including you).

Then the estimated market for the product in the industry can be calculated as follows:

$$\begin{aligned}
 \text{Market for the product} &= \text{Number of families} \times \text{Annual expenditure} \\
 &= \text{N}200 \times 50,000 \\
 &= \text{N}10,000,000 \\
 &\quad \underline{\text{N}10,000,000} \\
 \text{Market share per competitor} &= \frac{\quad}{5} \\
 &= \text{N}2,000,000.
 \end{aligned}$$

While your estimated share of the market is N2,000,000 you must remember that you are new to the market. It will therefore be unrealistic for you to assume you will capture your whole share of market initially. You may therefore have to reduce your estimate of your share of the market by some percentage to make your estimate realistic.

Another forecasting approach is to assume that sales will grow according to past history at a given percentage or that they will grow in proportion to the value of the Gross National Product (GNP). The GNP means the market value of all goods and services produced by a country in a given year. This approach assumes not only that you are already in business but also that there are no ups and downs in the economy. If you are just starting a new business, you have no past sales to work with. If, you can get your competitors' salesmen to make such estimates that will be fantastic. At the end of your opinion poll you average all the estimates of sales for your proposed product and arrive at the sales estimate and the market for the product. For example, assuming five salesmen give estimates of a particular product as follows:

<b>Salesman</b>	<b>Estimate</b>
A	N5,000,000
B	6,500,000
C	7,000,000
D	6,000,000
E	5,500,000
Total	<u>N30,000,000</u>
Average	= N6,000,000

You can therefore assume that the size of your market is about N6,000,000

It must be cautioned that this estimate is subject to the problem of human estimating optimism.

There are more sophisticated approaches to estimating the market for your product. You can consult books on business statistics or market research for more sophisticated approaches if you are interested. Any combination of the approaches discussed above will enable you make a reasonable estimate of the market for your product. You can also devise other creative approaches to assess the market. Once you have made a sales forecast, you have built the foundation for making the other estimates in your feasibility report.

### **3. The Management Team**

Another item of utmost importance in your feasibility report is a brief but sufficient description of the background and experience of the persons who will manage the enterprise. One financial institution considers strong market for the product and sound management as crucial. The financier's decision will depend heavily on his evaluation of the management team and its members' ability to perform their assigned roles.

### **4. Production Process and Production Plan**

Under this section you describe how to make the product, if the proposed business is a manufacturing enterprise. You describe clearly the stages the materials will go through before the finished product is produced from the factory. You can also include information on the location of the factory, space requirements and so on. You should outline the production costs involved.

If your project is agriculture, you should also describe the production methods. For instance, if you are planning to establish a vegetable farm,

you should include under the production process such activities like land clearing, seed bed preparation, nursery management and so on. If your agricultural project is concerned with crop production, you should describe such activities like land preparation, planting, weed control, harvesting, storage etc.

Where your proposed business is not manufacturing or something like agriculture, you do not need a production plan and related budgets but you will have to adapt the principles provided in this course to prepare relevant estimates like sales, purchases, operating expenses, etc.

Let us assume you are going into manufacturing. If that is the case, you have to prepare a production budget. This budget shows the quantity of finished products to be produced during a given period, say a year. You should remember that the quantity to be produced should be based on your sales forecast, availability of raw materials and the capacity of the factory. You should also estimate the quantity and types of the materials to be used, the numbers, hours of work and grades of workers to be employed and their pay. You should also estimate the type and cost of any facilities you may want to provide at the factory.

In this connection, you may have to prepare a materials cost budget. In this budget, you set a standard materials cost which shows the quantity of materials (standard quantity) to be used to produce a unit of finished product and the price to be paid for the right quality of material. The standard material cost can be calculated as follows:

$$\text{Standard Material Cost} = \text{Standard qty} \times \text{Standard price}$$

Your material cost budget is thus derived by multiplying the standard material cost per unit (i.e. single product) by the number of unit to be produced. Your material purchases should be enough to cover:

- the requirements of the factory for a flow of materials into production, and
- planned changes in the amount of materials to be held in the materials store.

It needs to be pointed out here that the preparation of a material cost budget may not be possible sometimes and may not even be necessary in some situations. The important thing, however, is that you give a careful thought to the quantity and cost of materials to be used in your factory. This will force you to plan very carefully like a good businessman.

Setting standard costs can be learned from experience. It is as you go along that you may be able to set a standard. Even then, the standard



needs review periodically especially if economic conditions in the country are not stable.

Just like in the case of materials you can also set up a labour budget. It is the same principles used in setting a materials cost budget that you use here. A standard labour cost can be developed by considering labour time and wage rates. You should estimate the number of labour hours to be spent on producing a unit of finished product and the rate of pay for the right grade of labour. A formula for calculating standard labour cost may be as follows:

$$\text{Standard Labour Cost} = \text{Standard Hours} \times \text{Standard Rate of Pay}$$

The calculation of the labour cost forces you to study the operations or stages involved in making the product in the factory, the time to be taken and the type of labour required, if you are experienced. For example, you can ask a production manager, supervisor or foreman in a similar factory to give you some help. A cost accountant in such a firm can also be of help.

Another cost you may think of estimating is the overhead or indirect costs of making the product. Factory overhead refers to those costs arising from the provision of factory facilities and services required to produce the finished products. The overhead budget will therefore cover all production cost not included in the materials and labour cost budgets, including such items as management and supervisors' salaries, depreciation of plant and equipment, repairs and maintenance, light, fuel and power and so on. With these estimates you will arrive at the production cost comprising:

- materials
- labour and
- overhead.

As you go through all the activities we have described so far you can see that doing a feasibility study is quite interesting and you can learn a lot in the process. It forces you to develop a high degree of discipline in the way of managing your affairs and business, in particular.

## **5. The Marketing Plan**

It is very important that you indicate in your feasibility report the marketing strategy you intend to follow to achieve your sales target as reflected by your sales forecast. It is necessary to emphasize that failure to meet your sales forecast will affect your Net Profit and will threaten the ability of the business to remain profitable. You therefore under the

marketing plan state your marketing goals and how you are going to achieve them.

You should describe the distribution channel you will use to sell the product. You should also describe your advertising and sales promotion arrangements. You should also specify who, where and when to implement the marketing plan.

### **Manpower Requirements**

Apart from your management team, there may be other grades of personnel the business will require in order to function properly. You should therefore under your estimate of the manpower requirements, outline the kind and number of personnel the business will need and their pay. For example, you need to determine whether you need one or two accountants, bookkeepers, production managers, supervisors, labourers, etc. You must also estimate their salaries or pay. If you have done your research well, you will have no difficulty in estimating the type and the cost of your manpower requirements.

### **Estimated Capital Expenditure**

Capital expenditure refers to expenditure on such things like plant and machinery, tools, transportation equipment, power plants, office furniture and equipment. Capital here therefore refers to those items that tie up capital for a long time and do not turn over into cash fast enough but take several years to return their cash outlay (i.e. money spent on them).

Under this section you should therefore estimate carefully your equipment requirements and the cost of each equipment. You can get help on this from suppliers of the machines and equipment. Determine the types and cost of office furniture and equipment you need to run the business. In the case of machines and equipment, you should include their transportation cost to the site and their installation charges as part of the capital expenditure. Your total capital expenditure should be made up of

- the cost of your fixed assets (equipment and fixtures as earlier explained) and
- start-up costs – initial expenditure in starting the business before actual operation commences.

### **Estimated Working Capital**

Under this section you estimate the amount of cash necessary to cover anticipated expenditure before revenue begins flowing in. This involves a study of anticipated payment for labour, utilities, rents, supplies and other expenses following initiation of the business. Inventory requirements (covering initial raw material cost) should be included in this estimate. If you have performed all the activities I have suggested so far, you will have no difficulty in determining the amount of working capital needed for, say, the first month or two.

### **Cash Budget**

The estimate of your working capital is followed by your cash budget, which is in a way planning for your working capital. The cash budget is nothing more than an estimate of your cash receipts and cash payments over a given period. To use the technical jargon, the cash receipt and cash payments are referred to as cash flow. The cash flow thus has two aspects: the cash inflow (the receipts) and the cash outflow (the payments).

When you deduct your total cash payments from your total cash receipts you get the estimated cash balance. You may prepare a cash budget for 12 months in respect of each year you want to prepare a projected balance sheet. The cash budget will help you not only anticipate your cash needs but also enable you exercise proper control over the management of cash in your business. Such control and monitoring help you prevent your business from experiencing financial crises whereby you run out of cash or have excess cash.

### **Projected Income Statement**

If you have done a good job up to this point in estimating your sales, inventory requirements (both raw materials and finished goods), payments for labour and other expense items, you will have no difficulty in preparing your estimated income statement. This is because the income statement summarizes your estimated operating expenses and operating revenue and show the Net Profit or Loss as the case may be.

The Net Profit is the return on your investment. If the Net Profit is not up to the desired minimum or acceptable level, you have to think twice before deciding to go ahead with the project. In preparing the income statement, you put all the income items on the right side of the statement.

### **Projected Balance Sheet**

The balance sheet summarizes the assets and liabilities of your business. Again all the information here will come from preceding estimates. The estimated figures for cash balance for a year, accounts receivable and inventories are together called current assets which refer, to all the items in the estimated capital expenditure (after deducting allowances for depreciation).

Liabilities will consist of amounts due to third parties and the owners of the business. Amounts due to third parties include accounts payable (i.e. the amounts the business owes on purchases). Amounts due to owners include the capital invested and, of course, the Net Profit.

When all the assets (except cash), liabilities, and capital are projected on to balance sheet the cash on hand can be determined by deducting the sum of the assets from the sum of liabilities, that is to say, after you have listed all the liabilities and all the assets (excluding cash), you obtain the total of liabilities and the total of assets. Then you subtract the total of assets from the total of liabilities; the difference becomes the cash balance at the end of the period. For example, if the sum of assets (except cash) is N900.00 and the sum of liabilities is N1,000.00, the cash balance is N100.00.

### **3.2 Profitability Analysis and Evaluation of the Project**

So far, all your estimates and analysis are geared toward enabling you to take the crucial decision to invest in the business or refrain from doing so. Here you will be given a few guidelines to help you make the final decision.

#### **Break–Even Analysis**

First, it is a good exercise for you to determine when the business will break-even. That is, when it will make no loss or profit. At the break-even point your total expenses will be equal to the total revenue generated by the business.

Determination of break-even point is easy. You can do this by following one of two approaches or both. We can call one approach the algebraic or computational approach. Another approach is the graphical approach.

##### **-the Algebraic Approach**

Under this method you use a simple formula to calculate the break-even point.

The formula can be stated thus:

$$\text{B-E Point} = \frac{\text{FC}}{P - \text{VC}}$$

Where C stands for fixed cost, P stands for unit selling price, and VC stands for unit variable cost.

Fixed cost is a cost that remains fixed and not affected by changes in the level of production/sales or business activity. Examples of fixed costs are rent, insurance, property taxes, and depreciation arising from time passage. You have to determine in your business which costs are fixed.

A variable cost varies with the volume of business activity. Examples of variable cost are cost of goods sold, sales commissions, some salaries, etc. the total variable cost is used in calculating the unit cost or cost per unit of the product produced. Thus if you make 100 units and your total variable cost is, say N200, then your unit cost is N2.00.

If we assume that the unit selling price is N4.00, then the

$$\begin{aligned} \text{B-E Volume} &= \frac{\text{FC}}{4 - 2} \\ &= \frac{\text{FC}}{2} \end{aligned}$$

If FC = N500.00

Then B-E volume = 500/2 units = 250 units

B-E Point (in naira) = N4 × 250 = N1,000.00.

### **Marginal Safety**

It is not enough to calculate break-even point. You should also determine the margin safety. The margin safety is the excess of actual or budgeted sales over the break-even volume. It is a measure of the extent sales may drop before the business begins to make losses. This means that sales must not be allowed to fall to such an extent that the margin of safety becomes very small. The smaller the margin of safety the less profitable the business becomes.

We can calculate the margin of safety with the simple formula:

$$\text{Margin of Safety} = A - B$$

Where A stands for budgeted sales, and B stands for break-even sales.

Let us take the break-even sales calculated above and assume that the budgeted sales are N2,500. The margin of safety is then calculated thus:

$$\begin{aligned} \text{Margin safety} &= \text{N2,500} - \text{N1,000} \\ &= \text{N1,500.00.} \end{aligned}$$

This means you must allow sales to fall below N1,500 otherwise the profitability of the business will be in danger. A sale below break-even volume will automatically result in a loss.

The idea is simple. If you want to make no profit and make no loss, then sell up to the break-even volume. On the other hand, if you want to make a profit, make your margin safety as large as possible.

Our analysis of break-even point has so far assumed that your business will be producing only one product. This in practice is not always the case. How then can you calculate the break even point where the business produces or sells more than one product?

The answer to the above question is that you should use the same techniques as you used in the one-product case. However, in the multi-product situation you must exercise great care in your allocation of fixed costs and indirect costs to the various products. For sure, you have to determine what proportion or percentage of the total fixed cost and total indirect cost will be allocated to a particular product or product line. The problem here is that the total fixed cost and total indirect cost are common to the whole business and you have to decide how to distribute those costs among the product lines.

Another point worth emphasizing is that in a multi-product company (that is, a company producing or selling more than one product) the sum of individual break-even point, unless the sales figure for each product bears the same relationship to total sales as the individual break-even points bear to the overall break-even point.

Let us give an example. Let us assume a business produces three different products as follows:

	A	B	C	
Suppose, their total projected sales and their break-even sales are in the proportions given below:				
	PRODUCT			TOTAL
	A	B	C	
Projected Sales	N10	N50	N40	N100
Break-Even Sales	N5	N25	N20	N50

The sum of the individual Break-Even sales of the above three products will be equal to their overall Break-Even point. This is because their individual projected sales bear the same relationship to total projected

sales bear the same relationship to total projected sales as the individual Break-Even points bear to overall Break-Even point.

Just take product A, for example. You can see that its Break-Even sales constitute 10 percent of the overall sales. How did we get 10 per-cent?

This is it.

$$5/50 \times 100/1 = 10\% \text{ Also, } 10/100 \times 100/1 = 10\%.$$

#### -the Graphical Approach

A graphical method can also be used but it is less exact than the computational method so, there is no need wasting time on it.

### Multiple Break-Even Charts

Just as you can calculate multiple Break-Even points in multi-product firm using the computational approach so also you can construct multiple Break-Even charts. If you are interested you can consult books in accounting or managerial finance. As long as you can use the algebraic approach the determination of multiple Break –Even points should pose little or no problem.

### Sensitivity Analysis

This is a kind of analysis in which factors or assumptions made in the study are changed and the effect on the rate of return or profit is observed. In other words, it is a technique used to measure the changes in the key factors that affect a project's cash in-flows and cash out-flows. Do not, therefore, be scared by the term, sensitivity analysis. It is easy to understand. Let us illustrate.

When you try to estimate what will happen to your profits if the cost of your doing business rises or falls, you are doing sensitivity analysis. Examples; what will happen to your profits if cost of raw materials falls? What will happen if the cost rises? What will happen if you raise your selling prices? All these are changes in the factors or variables that can have impact on your profits. When you consider the consequences of any of these assumed changes you are doing sensitivity analysis.

Let us take a concrete example. Suppose you are given the following information earlier used in or derived from the preceding Break-Even analysis:

unit selling price.....	N4.00
unit variable cost.....	N2.00
marginal income (i.e. N4 – N2).....	N2.00

fixed cost.....	N500.00
operating profit.....	N750.00
break-even point.....	N1,000.00

What will happen to profits if either of the following two events occurs;  
the selling price rises by 10%, or  
unit variable cost rises by N1.00?

Let us consider the impact of the first case. If the unit selling price rises by 10% it means that the new selling price is N4.40. How did we get N4.40? Here is how we arrived at it.

First,  $10\% \text{ of } N4.00 = 10/100 \times 400k/1 = 40k$   
Therefore  $N4.00 + 40k = N4.40k$

If at the selling price of N4 the business made a profit of N750.00, then at a selling price of N4.40 the profit can be calculated as follows:

$$\text{Profit} = 750/4 \times 22/5 = 75 \times 11 = N825.00$$

If the unit variable cost rises by N1.00 while other factors remain unchanged, it means that the new variable cost is N3.00. The contribution margin or marginal income will then be  $N4 - N3 = N1.00$

We can calculate the impact on profits of the increase in unit variable cost as follows.

At a marginal income of N2.00 (i.e.  $N4 - N2$ ) the profit was N750.00. Then at marginal income of only N1.00 the profit will be N375.00. We got this result by the following calculations:

$$\text{Profit} = 750/2 \times 1 = N375.00$$

We may then arrange the results of the above sensitivity analysis in a table as shown below:

**TABLE 1: SENSITIVITY ANALYSIS**

Nature of Variation or Assumption	Profit
Unit Selling Price, Unit Variable Cost And Fixed Cost remain unchanged	N750.00
Unit Selling Price rises by 10% while other Factors remain unchanged.	N825.00
Unit Variable Cost rises by N1.00 while other Factors remain unchanged.	N375.00



Before we leave this subject of sensitivity analysis, it is pertinent to point out that it is not absolutely necessary that you do the analysis. It will however enhance the quality of the feasibility study if you do so. The whole idea behind the exercise is to alert you to the consequences of possible changes in the circumstances of your business.

### **Evaluation of the Project**

It is necessary to appraise your project to determine whether it is worthwhile going into the business or not. In practice, there are three parties who may be interested in the appraisal of a project. These are:

- You – the entrepreneur. Your aim here is to satisfy yourself that the project has high prospects of being profitable.
- Institutional investors and financiers. These include commercial banks, investment banks, development banks like the bank of industry (BOI) and Nigeria Agricultural, Cooperative and Rural Development Bank (NACRD). The banks want to ensure the project has an impact on the national economy. They also want to ensure the project is profitable and that it will generate adequate cash to enable it (the business) pay its debt (if any) to the bank.

### **The Government**

The aim of the government in project appraisal is to ensure that the overall social and economic impact is good and to determine what forms of incentives the project is eligible for. Government is particularly interested in determining to what extent the project can contribute towards the saving of foreign exchange for the country.

In appraising a project, therefore, the aim is to minimize the capital and operational costs, to ensure high production efficiency and that the products or services can be sold at fair market prices. But above all, from your stand point as an entrepreneur, you should decide to establish the business if it passes profitability test i.e. if the project promises a satisfactory rate of return. The rate of return simply refers to the Net Profit generated by the business.

In general, there are four methods of appraising a business proposal. These are:

- Payback Method
- Annual Rate of Return
- Net Present Value and
- Discounted Cash Flow.

We shall be concerned with the payback method and annual rate of return method.

### The Payback Method

The payback period is the number of years it will take a business to recover the original investment from net cash inflows. Assume a project will cost N2,000.00. Assume also that the net cash inflows from the investment are estimated as follows:

Net cash inflows	
Year 1 -	1,000
Year 2 -	800
Year 3 -	600
Year 4 -	400
Year 5 -	200
	<b>3,000</b>

In the above example, the payback is  $2\frac{1}{3}$  years. We arrived at  $2\frac{1}{3}$  years in this way. In the first two years the business generated only N800 + N1,000 i.e. N1,800. This amount was N200 short of the investment of N2,000. then in the third year the business generated N600 and we assume the first N200 was generated in the first four months. So, the payback period for this project is  $2\frac{1}{3}$  years.

A simple formula for calculating Payback Period may be stated as follows:

$$\text{Payback Period} = \frac{\text{Total Investment}}{\text{Net Profit} + \text{Depreciation.}}$$

An implicit assumption in the above formula is that Net Cash inflows will be even through the forecast period. That is, we have to find the average of the net cash inflows for the forecast period. In the above example, the average will be N600 (i.e. N3,000/5). If we apply the above formula (assuming that depreciation is already taken into consideration in arriving at each net cash inflow for each year) the payback period will be calculated as follows:

$$\text{Payback Period} = 2,000/600 = 3\frac{1}{3} \text{ years}$$

As you can see, the above formula does not take into consideration the timing of the arrival of the cash inflows. This means that there is an average yearly net cash inflow of N600 without taking into consideration the variations in the amounts of the cash inflows from year to year. As our example shows, there will be N1,000 net cash

inflow in the first year, N800 in the second year, N600 in the third year and so on. Using the formula given above may result, therefore in, a situation where two alternative projects have the same payback period without considering the timing of the arrival of the cash inflows. This is a serious shortcoming which the user of the formula should bear in mind if he chooses to use the formula.

It is suggested that, wherever possible, you should use the first approach which takes into consideration the timing of the arrival of the cash flows. In the example given here, where we took the timing of the arrivals of the cash flows into consideration, we even had a shorter payback period of  $2\frac{1}{3}$  years!

You should set the time limit within which the business should payback. In a highly risky project you can set payback period as low as 1.5 years. Generally, if the calculated payback period is shorter than the time you set, you should go ahead with the project.

Generally, a project involving a relatively small capital investment and with a short payback period can be established without undertaking detail analysis beyond the payback calculation. The method can, however, be dangerous where large amounts of capital are involved. I assume that you are interested in establishing a relatively small manufacturing business or service and do not intend to invest several millions of Naira. In my opinion, if your proposed project has a payback period beyond 5 years you should think twice before investing your funds in the business.

### **Annual Rate of Return Method**

In this method, the profit on the investment is expressed as a percentage of the capital outlay. In the above example involving an investment of N2,000 the profit on the project is N1,000. That is  $N3,000 - N2,000 = N1,000$ . As this profit is earned over five years, the annual rate of return is 10% per annum.

That is;

$$\begin{aligned} & \frac{1000/5}{2000} \times \frac{100}{1} \\ &= 200/2000 \times 100/1 = 10\% \end{aligned}$$

Under the Annual Rate of Return Method of investment appraisal, the entrepreneur sets a target rate of return acceptable to him. For a project to be approved, the rate of return must be higher than the projected rate. Currently in Nigeria, some banks charge about 26 per cent on loans. You can bear this interest rate in mind in evaluating your project. By

this I mean you can use that interest rate as a guide in setting your desired rate of return. For instance, one can say that unless the business can yield 26 per cent Net Profit, after all expenses every year, he/she will not go into it.

#### **4.0 CONCLUSION**

In conclusion, it is necessary to remind you that if, for any reason, you do not want to cover all aspects of feasibility report, you should at least prepare the following:

1. A market forecast i.e. sales forecast
2. A market plan
3. A cash flow budget and
4. Projected income statement.

Now that you are on a firm ground, go ahead and try. Remember the old adage: 'if you try and do not succeed, try, try, and try again.' There is no way you can learn except by practice.

#### **5.0 SUMMARY**

The overall company's objective will be fully integrated into the various aspects highlighted below:

- **Purpose of the Report**

This is to ascertain the viability and profitability of such project.

- **The Objective and Scope**

The objective of the study should reflect the purpose for which the owner/investor commissioned the consultant.

- **The Business**

For an already established company/business, a brief history of the business will be necessary. The nature of the business, the status of the company, that is, whether it is limited liability or not, and if it is indigenous or foreign. The total shareholding and its composition, the business head office, directors and their nationalities.

For others, personal details of the investor or group of investors will be given. It may be pertinent here to state that financial institutions are more favourably disposed towards an incorporated business. Even then some financial institutions have peculiar demands.

- **The Project**

Here, the project to be undertaken should be clearly described. The product or service should be well defined. The industry to which the business belongs should be well identified. In fact, this is the point at which the total project package is considered.

- **Land and Location**

The description of the area where the business is or will be located and the plant layout are necessary here. Title to the land has to be secured either from the state or local government.

- **Operational Plan**

The plan of the conversion process and its use, the goal setting, policy making, forecasting, timing and standardization of work should be described. Details of each sub-unit of the project should be discussed.

- **Desirability of the Project**

Why is the particular project necessary? Of what importance is it to the society? What is the government policy on similar project? Is it export – oriented type that will earn the country foreign exchange? All these questions need to be answered in this section.

- **Demand and Supply Outlook**

There should be a market analysis of the product or service. This is to identify the gap in the supply/demand profile. This sector should also identify the market segment and their composition and competitors in terms of their names, location, strengths and weaknesses as well as strategies.

- **Management and Manpower Requirement**

Much of the success or failure of the operation will depend on the ability of personnel to effect the plan. In doing this, you need to consider the size of the organization, the resources, and get high caliber of personnel within the limit of available financial resources.

- **Salaries and Benefits**

The salaries provisions should take into consideration the manpower projection. Allowances should be made for annual increases in salaries

in subsequent years which will be directly related to the qualification of staff, nature of work, and occupational hazard there in.

- **Administrative Expenses**

This can be considered under the following headings:

- Salaries
  - Transport and vehicle maintenance
  - Insurance
  - Advertising
  - Utilities
  - Contingencies
  - Interest expenses
  - Tax
  - Depreciation
- **Production cost**
  - **Marketing strategy**
  - **Distribution and promotion**
  - **Sales and pricing**
  - **The project's general appraisal.**

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. State and discuss various key parts of a feasibility report?
2. Discuss various methods used to appraise a business plan?

## **7.0 REFERENCES/FURTHER READINGS**

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## **UNIT 5      PROJECT FINANCING AND ASSOCIATED RISKS**

### **CONTENTS**

- 1.0    Introduction
- 2.0    Objectives
- 3.0    Main Content
  - 3.1    Risk Minimisation Process
  - 3.2    Types of Risks
  - 3.3    Risks Common to both Construction and Operational Phases Participant/Credit Risk
- 4.0    Conclusion
- 5.0    Summary
- 6.0    Tutor-Marked Assignment
- 7.0    References/Further Readings

### **1.0    INTRODUCTION**

Project financing is an innovative and timely financing technique that has been used on many high-profile corporate projects. Employing a carefully engineered financing mix, it has long been used to fund large-scale natural resource projects, from pipelines and refineries to electric-generating facilities and hydro-electric projects. Increasingly, project financing is emerging as the preferred alternative to conventional methods of financing infrastructure and other large-scale projects worldwide.

Project financing discipline includes understanding the rationale for project financing, how to prepare the financial plan, assess the risks, design the financing mix, and raise the funds. In addition, one must understand the cogent analyses of why some project financing plans have succeeded while others have failed. A knowledge-base is required regarding the design of contractual arrangements to support project financing; issues for the host government legislative provisions, public/private infrastructure partnerships, public/private financing structures; credit requirements of lenders, and how to determine the project's borrowing capacity; how to prepare cash flow projections and use them to measure expected rates of return; tax and accounting considerations; and analytical techniques to validate the project's feasibility.

Project finance is finance for a particular project, such as a mine, toll road, railway, pipeline, power station, ship, hospital or prison, which is repaid from the cash-flow of that project. Project finance is different from traditional forms of finance because the financier principally looks

to the assets and revenue of the project in order to secure and service the loan. In contrast to an ordinary borrowing situation, in a project financing the financier usually has little or no recourse to the non-project assets of the borrower or the sponsors of the project. In this situation, the credit risk associated with the borrower is not as important as in an ordinary loan transaction; what is most important is the identification, analysis, allocation and management of every risk associated with the project.

This unit explains, in a brief and general way, the manner in which risks are approached by financiers in a project finance transaction. Such risk minimisation lies at the heart of project finance.

In a no recourse or limited recourse project financing, the risks for a financier are great. Since the loan can only be repaid when the project is operational, if a major part of the project fails, the financiers are likely to lose a substantial amount of money. The assets that remain are usually highly specialised and possibly in a remote location. If saleable, they may have little value outside the project. Therefore, it is not surprising that financiers, and their advisers, make substantial efforts to ensure that the risks associated with the project are reduced or eliminated as far as possible. It is also not surprising that because of the risks involved, the cost of such finance is generally higher and it is more time consuming for such finance to be provided.

## **2.0 OBJECTIVES**

At the end of this unit student will be able to discuss:

- discuss the risk minimisation process
- types of risks
- risks common to both construction and operational phases  
Participant/credit risk.

## **3.0 MAIN CONTENT**

### **3.1 Risk Minimisation Process**

Financiers are concerned with minimising the dangers of any events which could have a negative impact on the financial performance of the project, in particular, events which could result in: (1) the project not being completed on time, on budget, or at all; (2) the project not operating at its full capacity; (3) the project failing to generate sufficient revenue to service the debt; or (4) the project prematurely coming to an end.



The minimisation of such risks involves a three-step process. The first step requires the identification and analysis of all the risks that may bear upon the project. The second step is the allocation of those risks among the parties. The last step involves the creation of mechanisms to manage the risks.

If a risk to the financiers cannot be minimised, the financiers will need to build it into the interest rate margin for the loan.

### **STEP 1 - Risk Identification and Analysis**

The project sponsors will usually prepare a feasibility study, e.g. as to the construction and operation of a mine or pipeline. The financiers will carefully review the study and may engage independent expert consultants to supplement it. The matters of particular focus will be whether the costs of the project have been properly assessed and whether the cash-flow streams from the project are properly calculated. Some risks are analysed using financial models to determine the project's cash-flow and hence the ability of the project to meet repayment schedules. Different scenarios will be examined by adjusting economic variables such as inflation, interest rates, exchange rates and prices for the inputs and output of the project. Various classes of risk that may be identified in a project financing will be discussed below.

### **STEP 2 - Risk Allocation**

Once the risks are identified and analysed, they are allocated by the parties through negotiation of the contractual framework. Ideally, a risk should be allocated to the party who is the most appropriate to bear it (i.e. who is in the best position to manage, control and insure against it) and who has the financial capacity to bear it. It has been observed that financiers attempt to allocate uncontrollable risks widely and to ensure that each party has an interest in fixing such risks. Generally, commercial risks are sought to be allocated to the private sector and political risks to the state sector.

### **STEP 3 - Risk Management**

Risks must be also managed in order to minimise the possibility of the risk event occurring and to minimise its consequences if it does occur. Financiers need to ensure that the greater the risks that they bear, the more informed they are and the greater their control over the project. Since they take security over the entire project and must be prepared to step in and take it over if the borrower defaults. This requires the financiers to be involved in and monitor the project closely. Such risk management is facilitated by imposing reporting obligations on the

borrower and controls over project accounts. Such measures may lead to tension between the flexibility desired by borrower and risk management mechanisms required by the financier.

### **3.2 Types of Risks**

Of course, every project is different and it is not possible to compile an exhaustive list of risks or to rank them in order of priority. What is a major risk for one project may be quite minor for another. In a vacuum, one can just discuss the risks that are common to most projects and possible avenues for minimizing them. However, it is helpful to categorize the risks according to the phases of the project within which they may arise: (1) the design and construction phase; (2) the operation phase; or (3) either phase. It is useful to divide the project in this way when looking at risks because the nature and the allocation of risks usually change between the construction phase and the operation phase.

#### **1. Construction Phase Risk-Completion Risk**

Completion risk allocation is a vital part of the risk allocation of any project. This phase carries the greatest risk for the financier. Construction carries the danger that the project will not be completed on time, on budget or at all because of technical, labour, and other construction difficulties. Such delays or cost increases may delay loan repayments and cause interest and debt to accumulate. They may also jeopardise contracts for the sale of the project's output and supply contracts for raw materials.

Commonly employed mechanisms for minimising completion risk before lending takes place include: (a) obtaining completion guarantees requiring the sponsors to pay all debts and liquidated damages if completion does not occur by the required date; (b) ensuring that sponsors have a significant financial interest in the success of the project so that they remain committed to it by insisting that sponsors inject equity into the project; (c) requiring the project to be developed under fixed-price, fixed-time turnkey contracts by reputable and financially sound contractors whose performance is secured by performance bonds or guaranteed by third parties; and (d) obtaining independent experts' reports on the design and construction of the project. Completion risk is managed during the loan period by methods such as making pre-completion phase drawdowns of further funds conditional on certificates being issued by independent experts to confirm that the construction is progressing as planned.

## **2. Operation Phase Risk-Resource/Reserve Risk**

This is the risk that for a mining project, rail project, power station or toll road there are inadequate inputs that can be processed or serviced to produce an adequate return. For example, this is the risk that there are insufficient reserves for a mine, passengers for a railway, fuel for a power station or vehicles for a toll road.

Such resource risks are usually minimised by: (a) experts' reports as to the existence of the inputs (e.g. detailed reservoir and engineering reports which classify and quantify the reserves for a mining project) or estimates of public users of the project based on surveys and other empirical evidence (e.g. the number of passengers who will use a railway); (b) requiring long term supply contracts for inputs to be entered into as protection against shortages or price fluctuations (e.g. fuel supply agreements for a power station); (c) obtaining guarantees that there will be a minimum level of inputs (e.g. from a government that a certain number of vehicles will use a toll road); and (d) "take or pay" off-take contracts which require the purchaser to make minimum payments even if the product cannot be delivered.

### **Operating Risk**

These are general risks that may affect the cash-flow of the project by increasing the operating costs or affecting the project's capacity to continue to generate the quantity and quality of the planned output over the life of the project. Operating risks include, for example, the level of experience and resources of the operator, inefficiencies in operations or shortages in the supply of skilled labour. The usual way for minimising operating risks before lending takes place is to require the project to be operated by a reputable and financially sound operator whose performance is secured by performance bonds. Operating risks are managed during the loan period by requiring the provision of detailed reports on the operations of the project and by controlling cash-flows by requiring the proceeds of the sale of product to be paid into a tightly regulated proceeds account to ensure that funds are used for approved operating costs only.

### **Market/Off-Take Risk**

Obviously, the loan can only be repaid if the product that is generated can be turned into cash. Market risk is the risk that a buyer cannot be found for the product at a price sufficient to provide adequate cash-flow to service the debt. The best mechanism for minimizing market risk before lending takes place is an acceptable forward sales contract entered into with a financially sound purchaser.

### **3.3 Risks Common to both Construction and Operational Phases Participant/Credit Risk**

These are the risks associated with the sponsors or the borrowers themselves. The question is whether they have sufficient resources to manage the construction and operation of the project and to efficiently resolve any problems which may arise. Of course, credit risk is also important for the sponsors' completion guarantees. To minimise these risks, the financiers need to satisfy themselves that the participants in the project have the necessary human resources, experience in past projects of this nature and are financially strong (e.g. so that they can inject funds into an ailing project to save it).

#### **Technical Risk**

This is the risk of technical difficulties in the construction and operation of the project's plant and equipment, including latent defects. Financiers usually minimise this risk by preferring tried and tested technologies to new unproven technologies. Technical risk is also minimised before lending takes place by obtaining experts reports as to the proposed technology. Technical risks are managed during the loan period by requiring a maintenance retention account to be maintained to receive a proportion of cash-flows to cover future maintenance expenditure.

#### **Currency Risk**

Currency risks include the risks that: (a) a depreciation in loan currencies may increase the costs of construction where significant construction items are sourced offshore; or (b) a depreciation in the revenue currencies may cause a cash-flow problem in the operating phase. Mechanisms for minimizing resource include: (a) matching the currencies of the sales contracts with the currencies of supply contracts as far as possible; (b) denominating the loan in the most relevant foreign currency; and (c) requiring suitable foreign currency hedging contracts to be entered into.

#### **Regulatory/Approvals Risk**

These are risks that government licenses and approvals required to construct or operate the project will not be issued (or will only be issued subject to onerous conditions), or that the project will be subject to excessive taxation, royalty payments, or rigid requirements as to local supply or distribution. Such risks may be reduced by obtaining legal opinions confirming compliance with applicable laws and ensuring that any necessary approvals are a condition precedent to the drawdown of funds.

## **Political Risk**

This is the danger of political or financial instability in the host country caused by events such as insurrections, strikes, suspension of foreign exchange, creeping expropriation and outright nationalization. It also includes the risk that a government may be able to avoid its contractual obligations through sovereign immunity doctrines. Common mechanisms for minimising political risk include: (a) requiring host country agreements and assurances that project will not be interfered with; (b) obtaining legal opinions as to the applicable laws and the enforceability of contracts with government entities; (c) requiring political risk insurance to be obtained from bodies which provide such insurance (traditionally government agencies); (d) involving financiers from a number of different countries, national export credit agencies and multilateral lending institutions such as a development bank; and (e) establishing accounts in stable countries for the receipt of sale proceeds from purchasers.

## **Force Majeure Risk**

This is the risk of event which renders the construction or operation of the project impossible, either temporarily (e.g. minor floods) or permanently (e.g. complete destruction by fire). Mechanisms for minimizing such risks include: (a) conducting due diligence as to the possibility of the relevant risks; (b) allocating such risks to other parties as far as possible (e.g. to the builder under the construction contract); and (c) requiring adequate insurances which note the financiers' interests to be put in place.

## **4.0 CONCLUSION**

This unit only gives a brief overview of the common risks and methods of risk minimisation employed by financiers in project finance transactions. As stated previously, each project financing is different. Each project gives rise to its own unique risks and hence poses its own unique challenges. In every case, the parties - and those advising them - need to act creatively to meet those challenges and to effectively and efficiently minimize the risks embodied in the project in order to ensure that the project financing will be a success.

## **5.0 SUMMARY**

In the course of this study we were able to discuss project finance and the various risks associated with it.

## **6.0 TUTOR-MARKED ASSESSMENT**

State and discuss the various risks associated with project financing in Nigeria?

## **7.0 REFERENCES/FURTHER READINGS**

Bryce, M. D. (1960). *Industrial Development: A Guide to Accelerating Economic Growth*. USA: McGraw Hill.

Odufalu O. (2000). *The Principle and Techniques of Project Analysis and Evaluation*. Lagos: Y2K Academy Ltd.

## MODULE 2

Unit 1	Project Cycle (With Emphasis on the Financial and Economic Feasibility)
Unit 2	Project Planning and Control
Unit 3	Financing of project- objectives of financial analysis
Unit 4	Sources and uses of funds
Unit 5	Cash flow statements and working capital management

### UNIT 1 PROJECT CYCLE (WITH EMPHASIS ON THE FINANCIAL AND ECONOMIC FEASIBILITY)

#### CONTENTS

2.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Project Cycle Management
3.2	Application of Project Cycle by World Bank
3.3	Financial and Economic Feasibility
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Readings

#### 1.0 INTRODUCTION

The World Bank defines project as “a proposal for capital investment to develop facilities to provide goods and services’. It is a technically coherent production undertaking which can be carried out independently of other projects by a private or public agency. It is the smallest unit of investment activity for producing goods and services.

The United Nations (1958) on its part defines a project as ‘the compilation of data which will enable an appraisal to be made of the economic advantages and disadvantages attendant upon the allocation of a country’s resources to the production of specific goods and services’.

Projects may be conceived and prepared for all types of activities contained in the International Standard Industrial Classification, and may vary from a simple car-wash undertaking or an arable-crop farm to produce maize or beans, through a more complex manufacturing outfit such as aluminum cooking pots, to a more generalized investment involving many facilities and activities such as the automobile, the kainji dam, the iron and steel complex, the petroleum refinery, and the

construction of the railways. A project may be an investment to build something entirely new for example the BRT road constructing by Lagos State Government or for the expansion, improvement, rehabilitation, replacement or modernization of an existing facility.

A project may be distinguished from a programme. A programme is defined by Odufalu (2000), as a coordinated set of projects within the same country, state, local government areas or city. For example, a rice project may require for its success, access road and transportation facilities for the evacuation of the products, and water supply for parboiling rice to prevent the germination of the harvested rice. Both the road and transportation facilities, the water supply and the rice project may be regarded as a programme if they have to be simultaneously implemented to ensure the success of the rice project.

The World Bank, according to Odufalu (2000), regards project study as a continuous and self-sustaining cycle of activity which runs through four principal stages viz.: the identification of the project, its preparation, its appraisal, and supervision of the project in its construction and operating stages to make sure that it achieve its objectives.

## 2.0 OBJECTIVES

At the end of this unit students will be able to:

- describe process of project cycle management, and
- application of project management by World Bank.

## 3.0 MAIN CONTENT

### 3.1 Project Cycle Management

The process of planning and managing projects can be drawn as a cycle. Each phase of the project leads to the next.

**Identification:** To identify what a project will focus on, we need to find out who should benefit and what their needs are. A ‘needs assessment’ will give an overview of community problems. A ‘capacity assessment’ will help identify which problem the project should address.

The manner in which the process of project identification proceeds depends on the findings of the preliminary review of the situation and identification of relevant stakeholders. For example, if the constraints exist principally at the macro level, the problem may best be tackled through stakeholders operating at the national level. Stakeholders



network vertically as well as horizontally. Thus, intermediate level stakeholders can assist with addressing constraints at the community level as well as provide linkages from the field to the policy environment.

**Design:** Once it is decided to go ahead with the project, we can start to think about the detail. This involves carrying out further research into the people affected by a problem and how they are affected by it. We also need to consider the risks to the project and how we will measure the project's performance.

**Implementation:** During the implementation of the project it is important to monitor and review the progress of the project and any outside changes that affect it. The project plans should be adjusted where necessary.

**Evaluation:** Evaluation should be carried out at or after project completion. Evaluation could be carried out a few months or years after the project has finished in order to assess its long-term impact and sustainability.

**Lesson Learning:** While the project cycle is a useful way of outlining the stages of a project, it has one drawback: it makes it look as though one tool follows another. In fact, many of the planning tools can be used at any stage of the project. They should be repeated throughout the project's life to ensure that any changes that might affect project success are accounted for. Findings should also be used for organizational learning and to improve other projects.

### 3.2 Application of Project Cycle by World Bank

Each year the World Bank lends between US\$15-\$20 billion for projects in the more than 100 countries it works with. Projects range across the economic and social spectrum in these countries from infrastructure, to education, to health, to government financial management. The projects the bank finances are conceived and supervised according to a well-documented project cycle. Documents produced as part of the project cycle can be valuable sources of information for interested stakeholders wanting to keep abreast of the work the bank is financing and for businesses wishing to participate in bank-financed projects. Below is a step-by-step guide to the project cycle, the documents that are produced as part of the process, and how to access them.



### ***How the Process Begins: Poverty Reduction and Country Assistance Strategies***

The bank recognizes that many past assistance efforts, including some of its own, failed because the agenda was driven by donors rather than by the governments it was trying to assist. Under its current development policy, the bank helps governments take the lead in preparing and implementing development strategies in the belief that programmes that are owned by the country, with widespread stakeholder support, have a greater chance of success.

In low-income countries, the bank uses the [Poverty Reduction Strategy](#) (PRS) approach which involves widespread consultation and consensus-building on how to boost development. Under this process, a national poverty reduction strategy is prepared by the country, creating a framework for donors to better co-ordinate and align their programs behind national priorities. The government consults a wide cross-section of local groups and combines this with an extensive analysis of poverty in the country's society and its economic situation. The government determines its own priorities from this process and produces targets for reducing poverty over a three to five-year period. These are outlined in a Poverty Reduction Strategy Paper (PRSP). The bank and other aid agencies then align their assistance efforts with the country's own strategy - a proven way of improving development effectiveness.

The bank's blueprint for its work with a country is based on a Country Assistance Strategy (CAS) which, in the case of low income countries,

is derived from the priorities contained in the country's Poverty Reduction Strategy Paper. The CAS is produced in co-operation with the government and interested stakeholders. The preparation of the CAS may draw on analytical work conducted by the bank or other parties on a wide range of economic and social sectors, such as health, education, agriculture, public expenditure and budgeting, fiscal management, or procurement, among others.

### **The Identification Phase**

The bank's [Country Assistance Strategy](#) (CAS) forms the blueprint for its assistance to a country. In low-income countries, the CAS is based on the priorities identified in the country's Poverty Reduction Strategy Paper (as outlined above). The goals outlined in the CAS guide the priorities of the bank's lending programme and are a useful source of information for interested stakeholders and businesses wishing to identify potential future areas of bank lending. During the identification phase, bank teams work with the government to identify projects which can be funded as part of the agreed development objectives. Once a project has been identified, the bank team creates a Project Concept Note (PCN) which is an internal document of four to five pages that outlines the basic elements of the project, its proposed objective, likely risks, alternative scenarios to conducting the project, and a likely timetable for the project approval process.

### **Useful Public Documents**

The [Project Information Document](#) (PID) is prepared after an internal review of the PCN and is released publicly through the bank's [InfoShop](#). It is usually four to five pages long and contains the information mentioned above - the objective, a brief description, etc. It also contains the name of the World Bank Task Manager or Team Leader who is supervising the project, a useful contact for companies interested in bidding for work on the project. The PID is an essential resource for tailoring bidding documents to the project concerned.

The [Integrated Safeguards Data Sheet](#) (ISDS) is also prepared for the first time after the project's first formal review and made available publicly. It identifies key issues under the World Bank's safeguard policies for environmental and social issues, and provides information about how they will be addressed during project preparation.

### **The Preparation Phase**

This part of the process is driven by the country that the bank is working with and can take anything from a few months to three years, depending

on the complexity of the project being proposed. The bank plays a supporting role, offering analysis and advice where requested. During this period, the technical, institutional, economic, environmental and financial issues facing the project will be studied and addressed - including whether there are alternative methods for achieving the same objectives. An assessment is required of projects proposed for bank financing to help ensure that they are environmentally sound and sustainable (Environmental Assessment). The scope of the Environmental Assessment depends on the scope, scale and potential impact of the project.

### **Useful public documents**

An [\*Environmental Assessment Report\*](#) (EA) analyzes the likely environmental impact of a planned project and steps to mitigate possible harm.

An [\*Indigenous Peoples Development Plan\*](#) identifies potentially adverse effects on the health, productive resources, economies, and cultures of indigenous peoples.

The [\*Environmental Action Plan\*](#) - describes the major environmental concerns of a country, identifies the main causes of problems, and formulates policies and concrete actions to deal with the problems.

### **The Appraisal Phase**

The bank is responsible for this part of the process. Bank staff review the work done during identification and preparation, often spending three to four weeks in the client country. They prepare for bank management either Project Appraisal Documents (investment projects) or Programme Documents (for adjustment operations) and the Financial Management team assesses the financial aspects of the project. The PID is updated during this phase. These documents are released to the public after the project is approved (see below).

### **The Negotiation and Approval Phase**

After bank staff members have appraised the proposed project, the bank and the country that is seeking to borrow the funds, negotiate on its final shape. Both sides come to an agreement on the terms and conditions of the loan. Then the Project Appraisal Document (PAD) or the Program Document (PGD), along with the Memorandum of the President and legal documents are submitted to the Bank's Board of Executive Directors for approval. The appropriate documents are also submitted for final clearance by the borrowing government which may involve

ratification by a council of ministers or a country's legislature. Following approval by both parties, the loan agreement is formally signed by their representatives. Once this has occurred, the loan or credit is declared effective, or ready for disbursement, after the relevant conditions are met, and the agreement is made available to the public.

### **Useful Public Documents**

The [\*Project Appraisal Document\*](#) (PAD) presents all the information the Board needs to approve bank financing of the proposal. Before 1999, this document was called the Staff Appraisal Report. The [\*Program Document\*](#) (PGD) describes adjustment lending operations, and sets out the bank's appraisal and assessment of the feasibility and justification for the programme.

The [\*Technical Annex\*](#) supplements a Memorandum and Recommendation of the President for freestanding technical assistance loans, which do not require Project Appraisal Documents.

### **The Implementation and Supervision Phase**

The implementation of the project is the responsibility of the borrowing country, while the bank is responsible for supervision. Once the loan is approved, the borrowing government, with technical assistance from the bank, prepares the specifications and evaluates bids for the procurement of goods and services for the project. The bank reviews this activity to ensure that its procurement guidelines have been followed. If they have, the funds will be disbursed. The Bank's Financial Management Team maintains an oversight of the financial management of the project including periodically requiring audited financial statements.

### **Useful Public Document**

[\*Report on the Status of Projects in Execution\*](#) provides a very brief summary of all projects that were active during the previous fiscal year. Previously an internal communication to the Board of Executive Directors, the SOPE Report now is available to the public. Projects that closed during the fiscal year are no longer included in the SOPE, since their Implementation Completion Reports are also publicly disclosed.

### **The Implementation Completion Report**

At the end of the loan disbursement period (anywhere from 1-10 years), a completion report identifying accomplishments, problems, and lessons learned is submitted to the Bank Board of Executive Directors for information purposes.

## Useful public document

[\*Implementation Completion Reports\*](#) review the results and assess an operation on completion of each loan financed by the bank. Operational staff prepare these self-evaluations for every completed project.

## The Evaluation Phase

Following the completion of a project, the Bank's [\*Operations Evaluation Department\*](#) conducts an audit to measure its outcome against the original objectives. The audit entails a review of the project completion report and preparation of a separate report. Both reports are then submitted to the executive directors and the borrower. They are not released to the public.

## Useful Public Documents

[\*Project Performance Assessment Reports\*](#) rate project outcomes (taking into account relevance, efficacy, and efficiency), sustainability of results, and the institutional development impact. One in four completed projects (or about 70 a year) is chosen for a Project Performance Assessment Report, which takes Operations and Evaluation Department staff about six weeks to produce and normally includes a visit to the project in the borrowing country.

[\*Impact Evaluation Reports\*](#) assess the economic worth of projects and the long-term effects on people and the environment. These "second looks" at projects are performed five to eight years after the close of loan disbursements.

[\*Inspection Panel Reports\*](#) review claims by affected parties that the bank failed to follow its operational policies and procedures with respect to the design, appraisal and/or implementation of a bank-financed operation.

Projects may be dropped at any point in the project cycle from preparation to approval. For these projects, which never achieve active status, Project Information Documents, described above, are effectively the final documents.

## 3.3 Financial and Economic Feasibility

### What is a Feasibility Report?

A feasibility report tells you whether a business plan will succeed or fail. In other word, the report concerns itself with determining whether

the business you plan to do will be profitable. If the report indicates that the business cannot succeed then you must think of another plan.

Such a report, no matter how elementary, is very important and should be prepared by anyone who wants to start a new business or expand an existing one. If you happen to go to any bank or any other institution giving loans to businessmen, you will probably hear the loan officer telling you to go and bring a feasibility report or business plan which will show him whether there is a market for your product, whether you can manage the business and the financial implications of the proposal and whether or not the business proposal will be profitable. The formality, detail and complexity of the plan can vary with the size of the business. But irrespective of the size, the feasibility report should include at least a market forecast, a marketing plan, cash-flow budget and proforma income statement.

A feasibility report has many advantages. It helps you not only to make a decision whether to invest or not but also it helps you to raise capital for your business. It is doubtful if you can raise much capital without it. It is on the basis of your bankers evaluation of your business plan or feasibility report that he can decide whether your business has a chance of success and therefore the ability to repay the loan as and when due.

A feasibility report also serves as a basis for measuring the performance of your new business. For example, if in your feasibility report it was estimated you will make N100,000 sales of your product or service a month, you should compare your sales with the estimated sales of N100,000 to ascertain whether you are performing below or above forecast. Whenever there is a significant difference between the actual performance and estimate, you should find out why and take corrective action.

### **Critical Aspects of a Feasibility Report**

No two feasibility reports are the same but there are certain aspects of a feasibility report which every good report should have. Among these critical aspects are:

- a. Size of the market for your product or service.
- b. The management team for the business i.e. who are going to run the business and what is their background and experience.
- c. Financial requirements of the new business.
- d. A marketing plan i.e. how you will sell the product or service to be produced.
- e. Determination of profitability. You must be able to ascertain after some analysis how much profit to be expected from the business. If

there is no adequate profit, the proposal should be dropped. Similarly, of course, if the analysis shows that the business will make losses it will not be wise to invest your scarce capital in it.

#### **4.0 CONCLUSION**

In the course of our study in this unit we were able to examine the process of project management cycle. The project cycle process discussed the project identification, design, implementation, and evaluation. While the application of the project cycle by World Bank followed the same processes. Therefore, it is very important to use the foregoing mentioned sequence of events in designing project cycle for both private and public projects

#### **5.0 SUMMARY**

In summary, project cycle entailed those sequence of events needed to follow in order to complete a project. It usually involves the project identification where people needs and capacity assessments are conducted, project design, which involves carrying out further research into the people affected by a problem and how they are affected by it. During the implementation of the project it is important to monitor and review the progress of the project and any outside changes that affect it.

#### **6.0 TUTOR-MARKED ASSIGNMENT**

Enumerate the process of project cycle and relate it with a particular project?

#### **7.0 REFERENCES/FURTHER READINGS**

Bryce, M. D. (1960). *Industrial Development: A Guide to Accelerating Economic Growth*. USA: McGraw Hill.

Odufalu, O. (2000). *The Principles and Techniques of Project Analysis and Evaluation*. Lagos: Y2K Academy Ltd.

World Bank Publication (1999).



## **UNIT 2      PROJECT PLANNING AND CONTROL**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Project Planning
  - 3.2 Project Control
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

Engineers and engineering teams vary greatly in how they carry out their projects, in the university and in business. Their performance varies from smooth easy productivity, to complete chaos, ending in failure. Variations are expected, because of the inherent differences in the difficulties in the projects. This alone is not sufficient to explain all the differences in performance. On close examination, the variation can usually be attributed to the lack of proper planning and control. High performing engineers and engineering teams always have their project under control. When faced with an impossible task they find out quickly, face it, and reorient themselves. They overcome the difficulty and then get on with the next problem.

The basic elements of any project are the same. The differences can be attributed to the difficulties and details of basic elements. A typical project would consist of the following elements:

- Defining the objectives of the project
- Defining the constraints; physical, financial, manpower, and time
- Gathering information
- Generating alternate methods of solution
- Evaluating alternative solutions
- Selecting the best solution
- Carrying out solution
- Evaluating against objectives
- Generalizing and extending the results
- Iterate
- Report results.

Recognizing that these things have to be done is not planning. All projects are composed of these. Planning means identifying for each element the specific tasks that must be accomplished. **What** must be done, by **whom**, and **when**.

Unfortunately most projects do not permit the use of infinite time or money. Usually the time and/or money are established at the start. They represent a constraint of the project. The question is no longer, how the technical requirements are optimized. Rather, how to accomplish the technical requirements with the time and money available. Therefore, the technical goals schedules are based upon the time and money available. With the cost and delivery fixed as cornerstones, the technical effort must be made to fit.

Good project planning means identifying, early and continuously, the specific tasks that must be achieved; considering the resources in money, personnel, facilities, and time available. This means that where more than one person is needed, specific tasks are assigned to the individuals by name. They must commit themselves to accomplishing the task by a fixed time. And, there should be no duplication of effort. The interfaces between tasks must be recognized and the responsibility for resolving the differences assigned.

Beyond the responsibility for the performance of their own specific tasks, every engineer on the team must accept the responsibility for the success of the whole project. An excellent engineering task that is part of an unsuccessful project is wasted.

From experience and many examples it is apparent that:

- Good technical work is often obscured and even negated by poor administrative control.
- Good technical work cannot by itself control a project, and a project cannot control itself. Engineers must consciously work at controlling their projects.
- As the work on a project progresses the plans and schedules must change.  
Many engineers erroneously believe that technical work cannot be controlled. This in itself becomes a self-fulfilling prophesy.
- Management expects and demands that technical work be administered and controlled effectively.

## 2.0 OBJECTIVES

At the end of this unit students will be able to:

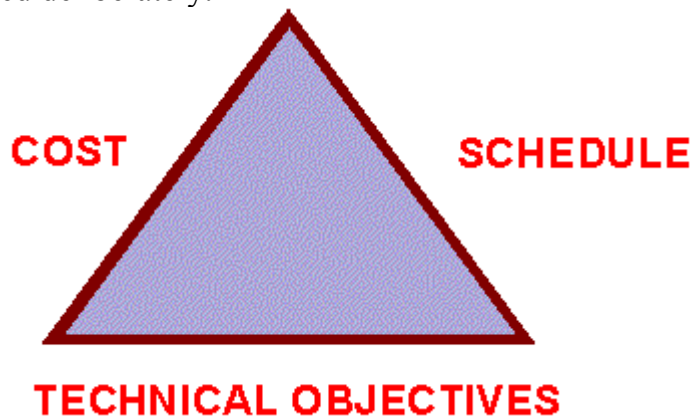
- use a project management discipline that is applicable to most projects
- use a step-by-step process for successful projects
- improve scheduling of project tasks
- improve estimation of project costs, resources and time
- control projects through special methods, tools and techniques
- assess and improve your current project management process
- immediately apply project management principles back at work.

## 3.0 MAIN CONTENT

### 3.1 Project Planning

#### The Project Management Triangle

Project management control can only be achieved when cost, schedule, and technical objectives are clearly documented, realistically derived, and managed deliberately.



The planning process should result in major parties to the project having a clear sense of the cost, schedule, and technical objectives. The establishment of these three should attempt to define the possible. The project's technical objectives should be derived from a clear understanding of the business requirements. Project costs should be realistic and affordable. The schedule should be achievable and appropriate for the business needs.

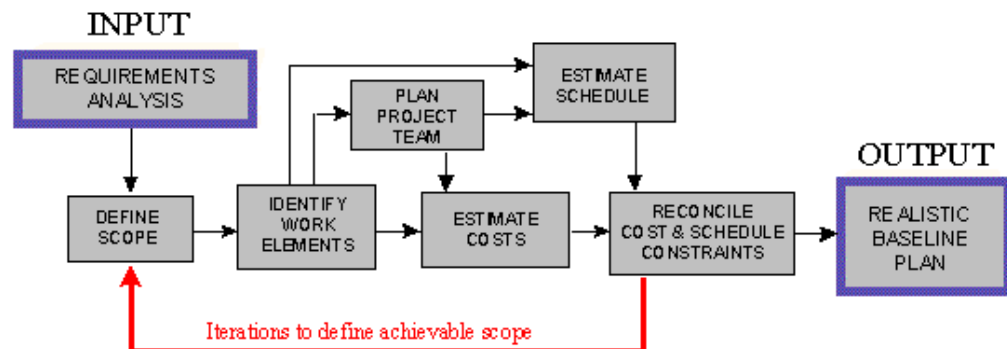
Trade-off studies balancing technical performance, schedule, and costs may be used to adjust project parameters to fit with organizational priorities. The realism inherent in determining these three project parameters can largely affect the perceived success or failure of the project.

Efforts to accelerate project schedules will usually increase project risks. Innovative techniques must be used to achieve orderly schedule compression without creating unacceptable risks and quality impacts. Without reducing project scope or attempting radical development methodologies, a project schedule can often be compressed by up to 20% by increasing concurrency of tasks and adding additional staffing. A typical project environment will usually involve pressures to add scope, accelerate schedule, and decrease costs. Nevertheless, changes to project scope and schedule accelerations will tend to make cost the dependent variable, causing cost to expand as if one were squeezing a balloon.

### Planning and Establishing the Project Baseline

*An Iterative Process*

**Begin Here:**



Project baseline definition begins with understanding the user or customer requirements. Understanding requirements involves making judgments about what the organization, technologies, and markets will be like in the time-frame after project completion. Sometimes a requirements analysis will have to penetrate beyond a mere synthesis of what user's think they need. The project requirement may be part of a larger need to improve vital business processes.

After the requirements analysis has resulted in definition of the project's technical scope, the cost and schedule estimates can be refined. Project costs and schedules can be estimated with no greater certainty than that inherent in the definition of technical scope. Cost and schedule estimates will require assumptions about labor categories, availabilities, and rates - knowing who will do the work - so assumptions and commitments about organizational involvements are needed. When cost, schedule, and requirements definition are acceptable to the organization, ***a project planning baseline must be established.***

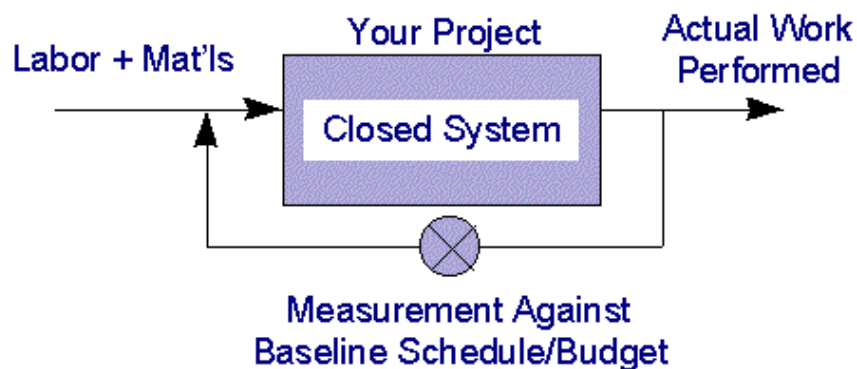
Very often, establishing the project baseline will be an iterative process involving a number of successive approximations before a baseline is

established. The first pass may result in a project that is too costly and will take too long. This can happen if the requirements analysis is done well. If the requirements analysis is done incompletely, the project plan may look affordable and achievable, but further emerging requirements may drive the project over budget and prolong the schedule.

A rigorous requirements analysis and a realistic cost and schedule estimate are necessary to establish a project baseline plan that provides a practical map for project success.

### **Manage Your Project as a Closed-System**

The only way to really control a project is to treat it as a closed system. That means you put the project "in a box" and then control what goes into the box and what comes out. The closed system must address each element of the project management triangle. Each element must be established as a BASELINE, and then changes tracked and managed methodically. You will never be able to stop changes on a project, but if you don't manage them methodically, your project will go out of control. Don't be surprised if establishing and maintaining control of the schedule, cost, and scope baselines is a continual struggle.



Most project environments are so turbulent that you will have to work hard to control the project as a closed system. This means you need to manage the scope, cost, and schedule in such a way that you understand and can generally quantify anything that changes as the project progresses. The primary way to do this is by various forms of "baseline controls."

The project scope needs to be defined clearly in a scope document or specification, and then any changes to that document need to be incorporated into the project plan very carefully. The cost estimates, project budgets, and project schedule (with associated commitments of work hours and resources) need to be baselined in order to have a useful standard against which to measure.

You need to be able to measure the work that goes into a project in dollars and work hours and the productivity that comes out of the project, in per cent completions and tasks accomplished. Without a stable baseline and measurement of input and output, the project cannot be measureable and in control.

On modest sized projects and in informal project management environments you will need to develop innovative ways to set up a performance measurement baseline and keep that baseline stable enough to be able to track project progress. In some cases, scope changes will be small enough so your baseline can still be useful for project tracking. For larger changes in project scope, the baseline will have to be updated. This is a judgment call for the project manager and for those involved with the project control function. You just need to have a sense that your baseline is useful for tracking schedule progress and for measuring project team productivity.

### 3.2 Project Control

Project control is making sure that the technical objectives of a project are achieved within the time and money constraints. Time and money scheduling is not separated from the technical activity. Technical decisions by their very nature affect time and money considerations.

Engineers must take responsibility for the control of their projects. If they do not, management will assign others to the control. Then the engineer will not have all of the factors under his jurisdiction. If others have control of time and money, rational trade-offs cannot be made. **Control** comprises of those administrative measures that need to be taken to get and keep a project on schedule with respect to time and money.

*The three parts of control are:*

- ***Scheduling***
- ***Monitoring***
- ***Controlling***

#### Scheduling

To schedule, *Scheduling is the planning and recording part of control.*  
the engineer

must identify and list the tasks that must be accomplished, and the activities required. The level of detail will depend on the purpose of the schedule and who will use it. Including too little detail, not enough planning takes place to anticipate major problems.

Including too much detail, obscures the important tasks and milestones in trivia and reduces flexibility. The level of detail should reflect the size and importance of the project. The preparation of a schedule generates a check list to be sure that nothing is forgotten at the planning stage.

On large projects, it is sometimes convenient to produce a relatively undetailed schedule covering the entire project. This is supplementing periodically with more detailed schedules showing decisions and assignments over short intervals between events in the overall schedule. These supplementary schedules can be produced as the project moves into different phases of the work.

It is essential to make and maintain schedules. Where more than one individual is concerned the schedule must be produced and distributed in a form that is easy to understand. The people using it and responsible for the work should easily see where they stand and appreciate what is expected of them. Each individual should perceive exactly what he is responsible for, and how their effort fits into the overall schedule. **Although actual names do not normally appear on the schedule, the items on the schedule should appear in a form that the responsibility can be identified with a single individual.**

#### SCHEDULING

*Schedule the whole project at the beginning.*

*Identify the critical items early.*

*Seek the best time and cost estimates.*

*Modify and update the schedule.*

*Bring all the contributors into the scheduling process.*

Often, tasks overlap in time on a schedule. This may show the interdependency between tasks or resources. It is, therefore, valuable to find, list, and show the milestones that signal start or completion of a tasks. Milestones should indicate when resources or information from one task must be available for use in another task. Thus, the schedule

will indicate when a task is completed and what must be available to perform or start additional tasks.

Sometimes, there may be a cost schedule associated with the time schedule that shows the relative intensity of activity on the project. The cost schedule acts as warning if the costs are out of control. It ensures there is a reasonable balance between costs and time, and that time/cost trade-offs are made deliberately.

Schedules provide a common meeting place between engineers, co-workers, and management during its construction and its subsequent updating. If everyone contributes to its construction and agreeing to its validity, everyone will make every effort to keep to it, where necessary. When circumstances dictate changes, they can be made without recriminations.

### **Monitoring**

*Monitoring means; the progress of the project must be continuously measured against the established schedule.*

No matter how good the schedules are, if they are not used for monitoring, they serve very little purpose other than recording expectations. Monitoring does not require holding to the schedule rigidly. Circumstances change and as the project develops new information becomes available that may require a change in plans. The schedules serve as a yardstick against which to measure progress, to show where and how plans must change. The schedule is a tool to keep attention on the final objective and goal.

The project's progress must be continually monitored with respect to the be higher for the first units and decrease thereafter until the point at which a market schedule. The engineer uses the schedule to see where he stands and to ensure that commitments are met as planned. If they cannot be met, then those whose work depends on them can be forewarned. Resources can be diverted, reallocated, and the schedule revised so the overall project commitment is achieved.

The checking of progress against schedules is never interesting and the temptation is to avoid it. Therefore, it should be a mandatory routine. The most useful way to do monitoring is to combine it with the regular project technical reviews. Thus, once technical progress is reviewed and established, the project's status is checked against the schedule.

Most projects do not always run smoothly, unexpected difficulties do occur. Monitoring is the only way that resources can be reallocated effectively and judiciously.



## Controlling

Controlling is the adjustment of the work when needed, so the overall time and money commitments are maintained or at least optimized. Thus, controlling means taking the appropriate action in the light of the information gained from monitoring. The whole purpose of scheduling and monitoring is to permit intelligent control.

Scheduling and monitoring by themselves are not control. Control must be deliberately exercised. The engineer must, with help, if necessary, decide what action must be taken to keep the project on schedule. Once the controlling action has been decided on, it must be implemented.

The most common error in project control is not acting soon enough. Action is delayed either because of poor monitoring or more often because of unwillingness to face the facts. The solution to a problem is assumed to be just around the corner or will yield on completion of the next test. The true facts cannot work against a project, but erroneous assumptions can. When it becomes reasonably clear that a certain line of investigation or approach is not going to work, stop it. Redirect the effort in a more fruitful direction. Delay wastes time and money.

It is often a mistaken assumption that delays or difficulties can be overcome by working harder. **Engineers should always be working hard.** This will rarely solve the problem. Delays can only be overcome by adding extra time or extra resources. Expert help can be sought, tests can be run concurrently, overtime can be put in, or the approach can be changed to one that is more likely to yield result. Control is exercised by a definite, specific action.

One of the major blocks to effective control is a common error in the engineer's view of the project. When engineers are given a task they tend to identify with it, and feel that its success is their success. The more effort they put into it the stronger they feel that way. This is good because it means commitment. Unfortunately, they often begin to see their solution or approach as the only correct one. Controlling actions threaten this image and engineers often resent and resist them. Engineers must learn to identify with success of the whole project. The controlling actions are for the good of the whole project. Individual success comes from being identified with successful projects.

## 4.0 CONCLUSION

In the course of our discussion in this unit, we were able to conclude that project planning and control could be achieved through proper establishment of project baseline and project management triangle

which comprises of costs, schedule and technical objectives. Also, we established that planning control comprises of three major parts which are scheduling, monitoring and controlling. Thus, any successful project officer must be articulate enough to effect the foregoing in their current and future projects.

## 5.0 SUMMARY

Proper project management means excellence in the technical, cost, and delivery aspects of the project. This requires proper attention being paid to the administrative aspects of the project **Scheduling, Monitoring, and Control.**

For good project planning and control, the following has to be observed:

- Schedule the whole project at the beginning
- Recognize interdependence of the parts
- Identify the critical items early
- Seek the best time and cost estimates
- Modify and update the schedule
- Bring all contributors into the scheduling process
- Follow and monitor on a regular basis
- Include all contributors in the monitoring process
- Plan general alternatives for each contingency
- Keep the goals and alternatives in mind
- Take early corrective action when needed
- Balance project effort
- Look for where effort can be reduced
- Make changes early rather than late
- Take early corrective action when needed
- Balance project effort
- Look for where effort can be reduced
- Make changes early rather than late

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss project control with particular reference to scheduling, monitoring and controlling?
2. Compare and contrast between project planning and control?

## 7.0 REFERENCES/FURTHER READINGS

Deiter G., "Engineering Design", Chapter 10.

Roadstrum W.H. "Being Successful As An Engineer" Chapter 4.

## **UNIT 3      FINANCING OF PROJECT-OBJECTIVES OF FINANCIAL ANALYSIS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Principle and Components of Financial Analysis
  - 3.2 Ratio Analysis
    - 3.2.1 Horizontal Analysis
    - 3.2.2 Trend Analysis
    - 3.2.3 Vertical analysis
    - 3.2.4 Ratio Analysis
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

Financial statement analysis is the analysis of the borrower's financial statement as it relates to the project and as it relates to the amount asked for. The first establishes the end and need for the loan as well as the repayment ability while the second will establish how much is required, for how long, when required, and whether the loan demand conforms to the existing directives/guidelines both of head of head office and of the Central Bank

### **2.0 OBJECTIVES**

At the end of this unit students will be able to:

- explain the principle of financial analysis
- describe the roles of credit officers
- investigate loan requirement of a project
- use ratio analysis as financial tools.

### **3.0 MAIN CONTENT**

#### **3.1 Principles and Components of Financial Analysis**

One is the analysis of borrower's financial statement as it relates to the project and as relates to the amount asked for. The first establishes the end and need for the loan as well as the repayment ability while the second will establish how much is required, for how long, when

required and whether the loan demand conforms to the existing directives and guideline both of head office and of the Central Bank.

In analyzing the end use, the banker should endeavour to establish whether all reasonable estimated costs are allowed for, and whether the estimates are realistic, He should also attempts to establish whether the sources of finance contemplated by the sponsors will be adequate and whether they would, in fact be forthcoming .otherwise the banker will be stuck with his own lending. Finally, he would attempt to ascertain the likely impact of the project on the level of production, sales, net earnings, borrowings etc. of the borrower, and when the project is expected to break even and start yielding profit.

Having established the above, the banker then turns to analyze the amount of the loan asked. An up-to-date audited balance sheet or the appropriate financial statement normally gives some clues. Generally, the capital employed including any undistributed profits is one guide to how much the customer can borrow; while the figures for creditors of all kinds, of stock and work-in-progress and of trade debtor show the liquid position of the business and may indicate the difficulty or with which credit can be paid regularly. All in all, the objective must be to determine that the amount demanded is neither too much nor too small but is just adequate, and that magnitude of the available surplus or profits, including any other cash accruals, will be adequate to service the loan effectively through repayment of principal and interest plus a margin for incidentals. The point to emphasize is that there should be a proper perspective of the financial position of the concern. For this purpose, a single year's performance as revealed in the profit and loss account and the balance sheet will not be adequate. A dynamic view has to be taken of the organization both in prospect and retrospect (Nwankwo, 1991 pp.125).

### **3.2 Tools and Techniques of Financial Analysis**

The tools for financial analysis are intended to show relationships and changes. Among the more widely used of these techniques are horizontal analysis, trend analysis, vertical analysis, and ratio analysis.

#### **3.2.1 Horizontal Analysis**

Generally accepted accounting principle calls for presenting comparative financial statements that give the current year and past year's financial information. A common starting point for studying such statement is *horizontal analysis*, which involves the computation of dollar amount changes and percentage changes from year to year. The percentage change must be figured to show how the size of the change

relates to the size of the amounts involved. A change of N1 million in sales is not so drastic as a change of N1 million in net income, sales is a larger amount than net income. The percentage change is figured as follows:

$$\text{Percentage change} = \frac{100 (\text{amount of change})}{(\text{base-year amount})}$$

the base year in any set of data is always the first year being studied. For example, from 1981 to 1982, the base year will be 1981.

### **3.2.2 Trend Analysis**

A variation of horizontal analysis is trend analysis, in which percentage changes are calculated for several successive years instead of between two years. Trend analysis is important because, with its long-run view, it may point to basic changes in the nature of the business. Besides comparative financial statements, most companies give out a summary of operations and data on other key indicators for five or more years.

### **3.2.3 Vertical Analysis**

Vertical analysis uses percentages to show the relationship of the different parts to the total in a single statement. Vertical analysis sets a total figure in the statement equal to 100 per cent and computes the percentage of each component of that figure. This figure would be total assets or total liabilities and stockholders' equity in the case of the balance sheet, and revenues or sales in the case of the income statement. The resulting statement of percentages is called a 'common-size statement'.

Vertical analysis is useful for comparing the importance of certain components in the operation of the business. It is also useful for pointing out important changes in the components from one year to the next when comparative common size statements are presented

### **3.2.4 Ratio Analysis**

Ratio analysis is a useful tool in financial statement and project analysis. It is used in the initial stages to reduce the large number of individual items in the financial statements to a fewer number of meaningful ratios that assist the lending officer to analyze the borrowers' current position. It helps also to identify critical areas for further detailed examination. The basic commonly used ratios relate to liquidity, management efficiency, leverage or debt, and profitability. The ratios are not universally applicable to all situations. Inventory turnover, for instance

is not relevant and meaningful in the analysis of service firms but very relevant and important in the analysis of retail or manufacturing firms. The table below shows the key ratios commonly used by analysts.

**Table 7: Commonly used Ratios in Financial Analysis of Project**

Type of Ratio	Name	Function	How Measured
(1) Liquidity	a) Current Ratio	Indicate the extent to which claims of short-term creditors are covered by assets that can be readily converted into cash without loss. High values suggest high safety margins for short-term creditors but does not consider quality of receivables and inventories.	$\frac{\text{Current asset (CA)}}{\text{Current liabilities (CL)}}$
	b) Quick (Acid test)ratio	A more reliable measure of liquidity than the current ratio. Purges the current ratio of lack of concern for the quality of receivables and inventories.  NB: a and b, each measures the ability of the firm to generate cash to meet short-term obligation	$\frac{\text{CA} - \text{Inventories}}{\text{Current liabilities}}$
(2) Profitability	a) Net Profit Margin or Return on Sale (ROS)	Measures profitability of the firm relative to sales.	$\frac{\text{Net Income}}{\text{Sale}}$
	b) Return on Equity (ROE)	Measures profitability of the firm relative to net worth or owner's equity in the firm.	$\frac{\text{Net Income}}{\text{Total Equity or Net worth}}$
	c) Return on Asset (ROA)	Measures profitability of the firm in relation to assets employed.	$\frac{\text{Net Income}}{\text{Total Assets}}$
(3) Leverage	a) Debt to Asset	Measures the amount of debt employed by the firm in relation to the total assets of the firm. The bigger the debt the more volatile the earnings because of the fixed charge.	$\frac{\text{Total Debt}}{\text{Total Assets}}$
	b) Debt to Equity	Measures the amount of debt employed by the firm in relation to total equity or net worth.	$\frac{\text{Long Term Debt}}{\text{Total Equity (Net Worth)}}$
	c) Times Interest or Financial Charges coverage	Measures the coverage of interest payment in the debt.	$\frac{\text{Earning before Interest} + \text{Taxes}}{\text{Annual Interest Expense}}$
	d) Account Payable Turnover	Measures account payable in relation to purchases	$\frac{\text{Average accounts Payable}}{\text{Av. Purch. Per Day}}$

(4) Activity or Management Efficiency	a)	Collection Period	Measures the degree of efficiency with which management collects receivables.	Average Account <u>Receivables</u> Sales per Day
	b)	Total Assets Turnover	Measures the degree of efficiency with which management utilizes assets in relation to sales	<u>Sales</u> Total Assets
	c)	Inventory Turnover	Measures management efficiency in turning over inventories to generate profit i.e. inventory control	<u>Sales</u> Av. Inventory
	d)	Fixed Asset Turnover	Measures net sales over net fixed assets	<u>Sales</u> Net Fixed Assets
	e)	Receivables Turnover	Measures sales over receivables	<u>Credit Sales</u> Account Receivables

For better results, common size ratios should be obtained by expressing each balance sheet item as a percentage of total revenue and each expense item as percentage of total expenses. The ratios should also not be analyzed in isolation as there are no absolute standard for them. They can be analyzed cross-sectionally by comparing the firms ratios with the ratios of peer firms in the industry or at a point in time. Another way is time series. This deals with historical trends in the ratios, in effect measuring the firm against itself at different time periods. This helps to detect looming problems before they occur.

A firm experiencing rapid sales but steadily declining profit margin because of rising costs may find, through time series analysis, that the rapid growth may have masked the dangerous slide in profit margins and would then try to do something about it – get away from the euphoria of rapid growth and correct deficiencies in costing matrix and therefore in profit margins.

It is also usually advisable not to rely on a single ratio but on combination of ratios. Return on equity, for instance can be broken down to its constituents such as leverage, profit margin, activity and common size ratios. This enables analysts to simultaneously view the key relationships governing the business enterprises.

#### 4.0 CONCLUSION

In the course of our study in this unit we were able to discuss the principles and components of financial analysis as well as use financial ratios as financial tools in analyzing and assessing the financial

capability of the borrowers of funds. Thus, the foregoing are very important in order to safeguard any future defaults in loan repayment.

## **5.0 SUMMARY**

In analyzing the end use, the banker should endeavour to establish whether all reasonable estimated costs are allowed for, and whether the estimates are realistic. He should also attempt to establish whether the sources of finance contemplated by the sponsors will be adequate and whether they would, in fact be forthcoming. Otherwise, the banker will be stuck with his own lending. Finally, he would attempt to ascertain the likely impact of the project on the level of production, sales, net earnings, borrowings etc. of the borrower, and when the project is expected to break even and start yielding profit.

## **6.0 TUTOR-MARKED ASSIGNMENT**

State and discuss how a loan requirement of a project could be investigated?

## **7.0 REFERENCES/FURTHER READINGS**

Nwankwo, G. O. (1980). *The Nigerian Financial System*.

CBN Briefs: Research Dept. series No. 95/03, June 1995 – Monetary Policy in Nigeria.

Odozi, V. A. - The Imperative of Economic Growth in Nigeria – The Nigerian Banker (Jan-June 2002).

Akingbola, E. B. O. - Strategies for Effective Management of Financial Institutions in the New Millennium (The Nigerian Banker - July-Dec 2001).



## **UNIT 4      SOURCES AND USES OF FUNDS**

### **CONTENTS**

- 1.0    Introduction
- 2.0    Objectives
- 3.0    Main Content
  - 3.1    Sources and Uses of Cash
  - 3.2    The Statement of Cash Flows
- 4.0    Conclusion
- 5.0    Summary
- 6.0    Tutor-Marked Assignment
- 7.0    References/Further Readings

### **1.0    INTRODUCTION**

The profit and loss account provides details of financial performance resulting in the net profit figure; the balance sheet is an explanation of the financial status of the enterprise in the form of a listing of its assets and liabilities at the close of the accounting period.

Accounting flows may be classified into three distinct types – profit flows, funds flows and cash flows. Therefore, funds flow and cash flow statements are needed to obtain a complete picture of accounting flows in respect of accounting period.

The funds flow statement provides reconciliation between the opening and closing balance sheets for a given accounting period through an explanation of the changes which have occurred. This explanation is in the form of an analysis of the sources of additional funds available to the enterprise during the accounting period, as well as an analysis of the manner in which they have been utilized. Consequently, the funds flow statement cover both the funds internally generated and additional funds obtained by the enterprise during the accounting period. The funds statement deals with the changes which have occurred in the size of the business, as well as changes which in the structure assets, liabilities, and invested capital. For all enterprises of a stipulated size, SSAP10 ‘Statement of Source and Application of Funds’ imposes a disclosure of a periodic funds flow statement, in addition to the traditional profit and loss account and balance sheet. In this unit we shall examine various aspect of sources and uses of funds.

## 2.0 OBJECTIVES

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

- discuss fund flow statement
- compute fund flow statement
- apply fund flow statement
- analyze sources and uses of funds in organization.

## 3.0 MAIN CONTENT

### 3.1 Sources and Uses of Cash

Those activities that bring in cash are called sources of cash. Those activities that involve spending cash are called uses or application of cash. What we need to do is to trace the changes in the firm's balance sheet to see how the firm obtained its cash and how the firm spent its cash during some time period. To get started, consider the balance sheet for the ABC Nig. Plc. in Table 6.1. Notice that we have calculated the change in each of the items on the balance sheets. Looking over the balance sheet for the ABC Nig. Plc, we see that quite a few things changed during the year. For example ABC increased its net assets by N149 million and its inventory by N29 million. Where did the money come from? To answer this and related questions, we need to first identify those changes that used up cash (uses) and those that brought cash in (sources).

Table 3.1

#### ABC NIGERIA PLC

Balance Sheets as of December 31, 2001 and 2002 ( N in million)

	2001	2002	Changes
<b>Assets</b>			
	N	N	N
<b>Current Assets:</b>			
Cash	84	98	+14
Account receivables			
Inventory	165	188	+23
Total	<u>393</u>	<u>422</u>	<u>+29</u>
	<u>642</u>	<u>708</u>	<u>66</u>
<b>Fixed Assets:</b>			
Net plant and Equipment			
Total Assets	<u>2,731</u>	<u>2,880</u>	<u>+149</u>
	<u>3,373</u>	<u>3,588</u>	<u>+215</u>
<b>Liabilities and Owners' Equities</b>			
<b>Current liabilities:</b>			
Account payable	312	344	+32

Notes payable	<u>231</u>	<u>196</u>	<u>-35</u>
Total	<u>543</u>	<u>540</u>	<u>-3</u>
Long term debt	<u>531</u>	<u>457</u>	<u>-74</u>
Owners' equity:			
Common stock and paid in surplus	500	550	+50
Retained earnings	<u>1,799</u>	<u>2,041</u>	<u>+242</u>
Total	<u>2,299</u>	<u>2,591</u>	<u>+292</u>
Total liabilities and owners' equity	<u>3,373</u>	<u>3,588</u>	<u>+215</u>

A little common sense is useful here. A firm uses cash by either buying assets or making payments. So, loosely speaking, an increase in an assets account means the firm, on a net basis, bought some assets, a use of cash. If an asset account went down, then on a net basis, the firm sold some assets. This would be net source. Similarly, if a liability account goes down, the firm has made net payment, a use of cash.

Looking again at Balance sheet of ABC Plc, we see that inventory rose by N29 million. This is a net use because ABC Plc. effectively paid out N29 million to increase inventories. Accounts payable rose by N32 million. This is a source of cash because ABC effectively has borrowed an additional N32 million payable at the end of the year. Note payable, on the other hand went down by N35 million, so ABC effectively paid off N35million worth of short-term debt – a use of cash.

Based on our discussion we can summarize the sources and uses from the balance sheet as follows:

Source of cash:		N'Million
Increase in account payable	32	
Increase in common stock	50	
Increase in retained earnings	<u>242</u>	
Total sources	<u>324</u>	
Uses of cash:		
Increase in account receivables	23	
Increase in inventory	29	
Decrease in notes payable	35	
Decrease in long-term debt	74	
Net fixed asset acquisition	<u>149</u>	
Total uses		<u>310</u>
Net additional cash	<u>14</u>	

The net addition to cash is just the difference between sources and uses, and our N14 million result here agrees with N1 million change shown on the balance sheet.

To further trace the flow of cash through the firm during the year, we need an income statement. For ABC Plc., the results for the year are shown in Table 3.2.

Notice here that the N242 additional to retained earnings we calculated from the balance sheet is just the difference between the net income of N363 and the dividends of N121.

Table 3.2

<b>ABC NIG. PLC</b>	
<b>2002 Income Statement</b>	
	<b>N' million</b>
Sales	2,311
Cost of goods sold	1,344
Depreciation	<u>276</u>
Earnings before interest and taxes	691
Interest paid	<u>141</u>
Taxable income	550
Taxes (30%)	<u>165</u>
Net income	<u>385</u>
Dividends	121
Addition to retained earnings	242

### 3.2 The Statement of Cash Flows

There are some flexibility in summarizing the sources and uses of cash in the form of a financial statement. However, if it is presented, the result is called statement of cash flows. Historically, this statement was called the statement of changes in financial position and it was presented in terms of the changes in net working capital rather than cash flows. We will work with the newer cash format.

We present a particular format for this statement in Table 3.3. The idea is to group all the changes into three categories: operating activities, financing activities, and investment activities. The exact form differs from one preparer to another.

Don't be surprise if you come across different arrangement. The types of information presented will be very similar; the exact order can differ. The key thing to remember in this case is that we started out with N84 million in cash and ended up with N98 million, for a net increase of N14 million. We are just trying to see what event led to this change.

Interest paid should really go under financing activities, but unfortunately that is not the way the accounting is handled. The reason, you may recall, is that interest is deducted as an expense when net

income is computed. Also, notice that the net purchase of fixed assets was 149. Because ABC Nig Plc. wrote off N276 million worth of assets (the depreciation), it must have actually spent a total of  $N149 + N276 = N425$  million on fixed assets.

Once we have this statement, it might seem appropriate to express the in cash on a per-share basis, much as we did for net income.

Table 3.3

**ABC NIG. PLC.**  
**2002 Statement of Cash Flows**  
**(N in million)**

Cash, beginning of year	<u>84</u>
Operating activity:	
Net income	385
Plus:	
Depreciation	276
Increase in account payable	32
Less:	
Increase in account receivables	- 23
Increase in inventory	<u>- 29</u>
	<u>641</u>
Investment activity:	
Fixed asset acquisitions	<u>- 425</u>
Net cash from operating activity	<u>-425</u>
Financing activity:	
Decrease in notes payable	- 35
Decrease in long term debt	- 74
Dividend paid	- 121
Increase in common stock	<u>50</u>
Net cash from financing activity	<u>- 180</u>
Net increase in cash	<u>14</u>
Cash end of the year	<u>120</u>

Ironically, despite the interest we might have in some measure of cash flow per share, standard accounting practice expressly prohibits reporting this information. The reason is that accountants feel that cash flow (or some component of cash flow) is not an alternative to accounting income, so only earnings per share are to be reported.

As shown in Table 3.4 it is sometimes useful to present the same information a bit differently. We will call this “the sources and uses of cash statement”

Table 3.4

**ABC NIG. PLC.**  
**2002 Sources and Uses of Cash**  
**(N in million)**

Cash, beginning of year	<u>84</u>
Sources of cash	
Operations:	
Net income	385
Depreciation	<u>276</u>
	661
Working capital:	
Increase in account payable	32
Long term financing:	
Increase in common stock	<u>50</u>
Total sources of cash	<u>743</u>
Uses of cash	
Working capital	
Increase in account receivables	23
Increase in inventory	29
Decrease in notes payable	35
Long term financing:	
Decrease in long term debt	74
Fixed asset acquisitions	425
Dividend paid	<u>121</u>
Total uses of cash	<u>707</u>
Net addition to cash	<u>14</u>
Cash end of the year	<u>120</u>

#### 4.0 CONCLUSION

In the course of our study in this unit we were able to discuss sources and uses of funds. Those activities that involve spending cash are called uses or application of cash while those activities that involve accumulation of cash are called sourcing for funds. Therefore, ability to balance the two activities or making the sourcing for funds greater than use and application of funds constitutes a good leverage for any company.

#### 5.0 SUMMARY

In summary, this unit emphasized on source and use of cash, statement of cash flows and its computation.

## **6.0 TUTOR-MARKED ASSIGNMENT**

State and discuss how a loan requirement of a project could be investigated?

## **7.0 REFERENCES/FURTHER READINGS**

Nwankwo, G. O. (1980). *The Nigerian Financial System*.

CBN Briefs: Research Dept. series No. 95/03, June 1995 – Monetary Policy in Nigeria.

Odozi, V. A. - The Imperative of Economic Growth in Nigeria – The Nigerian Banker (Jan-June 2002).

Akingbola, E. B. O. - Strategies for Effective Management of Financial Institutions in the New Millennium (The Nigerian Banker - July-Dec 2001).

## **UNIT 5      CASH FLOW STATEMENTS AND WORKING CAPITAL MANAGEMENT**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Cash Flow
  - 3.2 Benefits from using Cash Flow
  - 3.3 Managing Short-Term Net Cash Flows
  - 3.4 Liquidity Management
  - 3.5 Managing Inventory
  - 3.6 Managing Accounts Receivable
  - 3.7 The Cash Operating Cycle
  - 3.8 Forecasting Working Capital
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

Cash flow simply means the difference between number of Naira that came in and the number that went out. For example, if you were the owner of a business, you will be very interested in how much cash you actually took out of your business in a given year. How to determine this amount is one of the things we shall discuss in this part of our study.

At the fundamental level, firms do two different things: they generate cash and spend it. Cash is generated by selling a product, an asset or a security. Selling a security involves either borrowing or selling an equity interest (i.e. shares of stock) in the firm. Cash is spent in paying for materials and labour to produce a product and in purchasing assets. Payments to creditors and owners also require the spending of cash. The cash flow identity summarizes the total cash result of all transactions a firm engages in during the year.

In the short term, however, a considerable amount of managerial resources is devoted to day-to-day decision making in respect of working capital. Working capital, which also has an effect on a company's total market value, consists of short-term (current) assets and short-term (current) liabilities which, by definition, have terms to maturity less than one year. Current assets can be funded wholly or in part on a short-term basis, with net working capital measured as current assets less current liabilities.



This begins by defining the main components of current assets and current liabilities and by describing the role of working capital in a company's operations.

Attention is then turned to the core element in working capital: the management of cash flows. In long-run analysis, the focus is on annual net cash flows. In short-run analysis, a key issue is how the current year's net cash flows are expected to take shape on a daily or weekly basis. The expected short-term behaviour of net cash flows involves a company in developing strategies to avoid financial distress and bankruptcy, especially if the company anticipates sustained periods over which cash outflows will exceed cash inflows.

Following this, some of the basic principles involved in modeling the components of working capital are described. These relate to the management of cash and marketable securities, inventory and account receivable (or trade debtors). In terms of current liabilities, there are two main components: accounts payable (or trade creditors) and short-term debt financing.

Finally, overall working capital policy is examined in terms of a company's overall level of investment in current asset and in respect of the strategy the company adopts in matching the maturity structure of its assets and liabilities.

## **2.0 OBJECTIVES**

At the end of this session students should be able to:

- describe cash flow statement
- explain the various changes occur over the period on the balance sheet
- prepare an income statement
- describe the core element in working capital: the management of cash flows
- explain the basic principles involved in modeling the components of working capital
- define the working capital policy
- describe the various strategy involved in application of working capital.

### 3.0 Main Content

#### 3.1 Cash Flow

**Cash flow** is an accounting term that refers to the amounts of [cash](#) being received and spent by a business during a defined period of time, sometimes tied to a specific project. Measurement of cash flow can be used:

- to evaluate the state or performance of a business or project.
- to determine problems with liquidity. Being profitable does not necessarily mean being liquid. A company can fail because of a shortage of cash, even while profitable.
- to generate project [rate of returns](#). The time of cash flows into and out of projects are used as inputs to financial models such as [internal rate of return](#), and [net present value](#).
- to examine income or growth of a business when it is believed that accrual accounting concepts do not represent economic realities. Alternately, cash flow can be used to 'validate' the net income generated by accrual accounting.

Cash flow as a generic term may be used differently depending on context, and certain cash flow definitions may be adapted by analysts and users for their own uses. Common terms (with relatively standardized definitions) include [operating cash flow](#) and [free cash flow](#).

#### ***Classification***

Cash flows can be classified into:

4. **Operational Cash Flows:** Cash received or expended as a result of the company's core business activities.
5. **Investment Cash Flows:** Cash received or expended through **capital expenditure**, investments or acquisitions.
6. **Financing Cash Flows:** Cash received or expended as a result of financial activities, such as receiving or paying loans, issuing or repurchasing stock, and paying [dividends](#).

All three together are necessary to reconcile the beginning cash balance to the ending cash balance.

#### 3.2 Benefits from Using Cash Flow

The [cash flow statement](#) is one of the four main financial statements of a company. The cash flow statement can be examined to determine the short-term sustainability of a company. If cash is increasing (and operational cash flow is positive), then a company will often be deemed

to be healthy in the short-term. Increasing or stable cash balances suggest that a company is able to meet its cash needs, and remain solvent. This information cannot always be seen in the income statement or the balance sheet of a company. For instance, a company may be generating profit, but still have difficulty in remaining solvent.

The cash flow statement breaks the sources of cash generation into three sections: operational cash flows, investing and financing. This breakdown allows the user of financial statements to determine where the company is deriving its cash for operations. For example, a company may be notionally profitable but generating little operational cash (as may be the case for a company that barter its products rather than selling for cash). In such a case, the company may be deriving additional operating cash by issuing shares, or raising additional debt finance.

Companies that have announced significant [writedowns](#) of assets, particularly goodwill, may have substantially higher cash flows than the announced earnings would indicate. For example, telecoms firms that paid substantial sums for [3G](#) licenses or for acquisitions have subsequently had to write-off goodwill, that is, indicate that these investments were now worth much less. These write-downs have frequently resulted in large announced annual losses, such as [Vodafone's](#) announcement in May 2006 that it had lost £21.9 billion due to a writedown of its German acquisition, [Mannesmann](#), one of the largest annual losses in European history. Despite this large "loss", which represented a sunk cost, Vodafone's operating cash flows were solid: "Strong cash flow is one of the most attractive aspects of the cellphone business, allowing operators like Vodafone to return money to shareholders even as they rack up huge paper losses."

In certain cases, cash flow statements may allow careful analysts to detect problems that would not be evident from the other financial statements alone. For example, WorldCom committed an accounting fraud that was discovered in 2002; the fraud consisted primarily of treating ongoing expenses as capital investments, thereby fraudulently boosting net income. Use of one measure of cash flow ([free cash flow](#)) would potentially have detected that there was no change in overall cash flow (including capital investments).

### **3.3 Managing Short-Term Net Cash Flows**

In the short term, how net cash flow takes shape on a daily or weekly basis has an important bearing on value.

## **Cash Outflows**

Over a year, cash outflows will consist of regular payments to meet wages and salaries, and bills furnished by suppliers. Cash outflows will also occur in respect of tax-demands, interest payments and fees which can be expected at specific times during the year and in respect of the purchase of plant and machinery for long-term capital investment. These constitute what is referred to as the transactions motive for holding cash.

There may also be unanticipated events over a year which requires a company to have immediate access to cash resources. This constitutes the precautionary motive for holding cash. A speculative motive can exist to enable a company to take advantage of undervalued inputs or equipment which come up for sale due, for example, to a competitor going bankrupt. There is a fourth reason for holding cash known as a compensating balance motive. Here a company's bank may require it to hold minimum balances in its current account in order to indirectly cover the bank's costs of administration. If a company receives no interest on its current account, its bank receives all of the income earned on the company's balances through the bank's own investment strategies. Recently there has been a tendency to move away from compensating balances, with companies negotiating transactions fees with banks and receiving current account interest payments, or investing their surplus cash elsewhere.

## **Cash Inflows**

Where cash inflows are concerned, these can be expected to occur at regular intervals over the year largely as a result of the pattern of sales. This pattern can, however, be uneven if sales are seasonal. For example, in the cases of toy manufacturers, and department stores the majority of sales, and hence cash inflows, can be expected to occur in the months around Christmas. In the case of a clothing manufacturer a significant proportion of orders can be expected during the weeks in which this industry has its national and international fashion shows.

In addition, anticipated cash inflows may be disrupted due to sudden and unexpected change in the economy. If, for example, there is an unanticipated rise in interest rates, short-term trade debtors who also have high levels of bank debt may respond by delaying settlement of their invoices, using their own cash inflows to meet higher bank interest charges. Further, a major customer of a company may fail leaving significant amounts of unpaid debts.

## Net Cash Flow Policy

Given the opportunity costs of cash, in terms of borrowing and lending rates, it is in the interests of a company to:

- delay its expected cash outflows as long as possible, subject to minimizing the risks of jeopardizing input supplies
- maximize, at a current point in time, its expected cash inflows, subject to minimizing the risk of jeopardizing customer goodwill
- avoid significant periods when excess cash balances earning no interest are likely to increase as a result of cash inflows exceeding cash outflows; and
- avoid incurring costs associated with using short-term bank loans or overdrafts to cover significant periods when cash outflows exceed cash inflows.

In the short-term in order to cope with periods when net cash flows are expected to be negative and to avoid, at other times, holding excessive amounts of idle cash balances, a company can invest in a portfolio of marketable securities which earn interest. Investment in this portfolio is increased when short-term net cash flows are positive. When cash outflows exceed incoming cash receipts, some of the short-term marketable securities are sold to meet the deficit.

There are problems of capital or interest rate, risk involved in holding a portfolio of marketable securities. Consequently, companies, in seeking to avoid financial distress, tend to invest surplus cash balances in short-term marketable securities which long-term prices, in response to a given interest rate change, vary less than those of long-term marketable. This minimizes interest rate risk but entails a cost since, with the term structure of interest rates sloping upwards for most periods of time, short-term marketable securities earn a lower rate of return than long-term marketable securities.

In general the optimal level of cash and marketable securities will be determined in a much wider risk-return trade-off context, where the risk of not being able to meet short-term cash outflows is set against the opportunity costs of foregoing investments in long-term physical assets. On average, returns on the latter exceed the returns which companies can earn on both short-term and long-term financial asset.

### 3.4 Liquidity Management

Liquidity is defined as the ability to realize value in cash. It has two components:

- the conversion time of an asset, that is, the time lag between deciding to sell an asset and receiving payment for it; and
- its conversion price.

Cash has zero conversion time and no conversion price risk. Marketable securities, provided they are actively traded, have zero conversion time but have significant conversion price risk associated with interest rate risk.

The optimal level of liquidity, that is, a level which is not too low as to produce significant probabilities of financial distress and bankruptcy, and not too high as to reduce the rate of return on long-term investment, is difficult to determine. As a rough guide a number of short-term financial ratios can be examined to determine if an optimal liquidity policy is being pursued. Beginning with cash and marketable securities ratios, these are:

#### **Cash + Marketable Securities**

Current Assets  
and

#### **Cash + Marketable Securities**

Current Liabilities

Reasonably large values of the former indicate that cash and marketable securities can provide substantial sources of funds to finance any increases in current assets which might occur with increased sales. Reasonably high levels of the latter measure the ability to meet current liabilities without the need to liquidate other current assets, for example inventory, or without recourse to external sources of finance.

It would be wrong, however, to determine the liquidity position of a company purely in cash ratio terms. As indicated, inventory can be sold directly for cash, but it may have a relatively long conversion time and have a conversion price which is significantly less than the inventory's intrinsic value. The latter will occur especially if it is known that inventory is being offered for sale in a situation of financial distress.

Banks and financial institutions provide factoring services in respect of inventory and invoice discounting in respect of accounts receivable so as to eliminate conversion time. Here, a part or a whole of a company's inventory and/or its accounts receivable are purchased by a factoring company which, consequently, provides an immediate infusion of cash. Again, however, the conversion price will be below the intrinsic value of the current asset being purchased since factors earn their returns from obtaining assets at significant discounts and then reselling them or, in the case of accounts receivable, collecting payments due.

Two, more broadly based liquidity, measures take some of the above points into account. The first is the current ratio defined as:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

This encompasses net working capital (current assets less current liabilities) and is a measure of a company's capacity to meet its liabilities, due within one year, out of current assets. Because a substantial proportion of current assets includes inventory which, assuming factoring services are not used, has a positive conversion time and significant conversion price risk, a desirable level for this ratio is taken, on average, to be 2.1. The second liquidity measure is referred to as the Acid Test or Quick ratio. This ratio nets out the effect of inventory and is defined as:

$$\text{Quick Ratio} = \frac{\text{Cash Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

On average, its optimal level is considered to be 1:1,

These cash, current and quick ratios are unlikely to give a full picture of a company's liquidity position. Back-up lines of credit which may not be explicitly observable can be important, for example, a bank's willingness to provide it has placed on a company's current account and a bank's willingness to provide additional short-term loans at short notice. These factors will help to determine a company's financing flexibility which, as explained in unit 11, partly depends on the levels of short-term and long-term tangible assets already pledged in existing loan contracts. Indeed the ability of a company to provide a near-term cash flow forecast, and the variability surrounding near-term cash flows, also play a part in determining the effect of liquidity on a company's market value.

The above introduces a dynamic aspect to liquidity which is not normally picked up in static (at a point in time) short-term financial

ratios. The dynamic aspect involves the speed with which a company can alter its short-term position to avoid a crisis. It has been argued that one possible way of accommodating this is by considering a ratio based on a company's earning power, that is, the ratio of:

**Cash Liabilities – Quick Assets x 365**  
**Operating Funds Expected to be Generated over a Year**

This ratio gives the number of days required to pay off net current debt, that is, current debt not covered by liquid or quick assets. If, for example, this ratio exceeds 365 a company will be unable to meet its net current obligations out of its current year's expected earnings. Alternatively, if the ratio is significantly below 365 and short-term difficulties arise. The indication may be that additional short-term finance will be obtainable since banks would view such funding as entailing low risk. Expected earnings over the current year are not, however, a substitute for a short-term cash flow forecast which provides better evidence of the ability to repay net current debt.

### **3.5 Managing Inventory**

Cash and marketable securities are a form of inventory; therefore, when considering inventory in the wider context of raw materials, finished goods and spare parts, the basic principles used in cash management are applied. Indeed, the Economic Order Quantity Model was developed originally with physical inventory in mind. Here for example, the optimal level of raw materials over an inventory holding periods is determined in relation to the demand for a company's product and the holding and ordering costs of stock. Holding costs include the opportunity costs of financing inventory and of warehousing space together with any insurance costs.

As in the case of running out of cash, there are costs involved in running out of raw materials spare parts in terms of potential disruptions to production runs and sales patterns. Additional physical inventory costs can include the danger of a deterioration in the quality of inventory if it is held for too long; obsolescence, especially if the inventory is of a technical nature, and lead time variations, that is, the time lag between ordering and receiving new inventory. An important potential benefit from holding inventory is associated with possible price discounts on bulk purchases. Moving beyond the Economic Order Quantity Model, optimal control theory can be used to take account of unpredictability in product demand patterns.

A recent approach to inventory management in companies with repetitive manufacturing systems has involved near elimination of stock



holdings. This just-in-time inventory system requires suppliers to provide that relevant inputs, in their relevant quantities, at the precise points in time when they are needed in a manufacturing operation. There are costs in attempting to ensure that the just-in-time system works. These involve developing co-coordinating and monitoring operating plans between a company and its suppliers.

$$\text{Inventory Turnover} = \frac{\text{Costs of Goods Sold}}{\text{Inventory}}$$

A relatively high inventory turnover ratio may suggest that a company is managing this current asset relatively efficiently. It could suggest, for example, that excessive amounts of stock, which would incur a significant probability of obsolescence and high warehousing costs, are not being held. On the other hand, a relatively high ratio could indicate that not enough stocks are being held to support future potential sales growth. In effect, a company's inventory turnover ratio should be judged in relation to the nature of the stock being held and in respect of a base point, such as the average inventory turnover ratio for the industry in which the company is located.

### **3.6 Managing Accounts Receivable**

A company which grants trade credit to its customers creates current assets in the form of accounts receivable or trade debtors. It also influences its average collection period, that is, the average time lag between supplying customers and receiving cash payments in settlement of invoices. As explained, granting trade credit can have an important effect in stimulating a company's sales and thus, given its average collection period, its sales revenue.

The average collection period is important in an opportunity cost sense since it involves a company in foregoing interest on cash which could have been invested in marketable securities. An important additional factor in offering trade credit is the probability of incurring bad debt that is, selling to customers who significantly delay or even default on their payments. Granting trade credit can be analyzed in terms of NPV.

As an investment decision, while the factors influencing the trade credit decision are complex, two simple examples are presented below to illustrate the basic principles.

This is followed by a brief discussion of consumer credit evaluation.

### The Average Collection Period

Looking at the average collection period, one way of reducing this is by changing or introducing, if not already in existence, discounts on the list price of goods sold, the discounts only being available to customers who settle their accounts within a specified period. (Such a policy can also influence sales). While a reduction in the average collection period has a benefit in that it reduces interest foregone on accounts receivable, it has a cost to the extent that discounts are taken up by customers and, consequently, profits from increased sales are reduced.

To illustrate these concepts, consider a company which has monthly sales of N2m and annual sales of N24m. Its average collection period is 30 days, indicating that there is approximately one month between it supplying its products and receiving payments for them. The company has therefore, an average investment in accounts receivable of N2m. in terms of its annual sales the company has an accounts receivable turnover ratio.

$$\text{Receivables Turnover} = \frac{\text{Annual Sales}}{\text{Average Receivables Balance}} = \frac{\text{N24m}}{\text{N2m}} = 12$$

Note that the ratio for the average collection period is formally defined on 365 days in the year, as:

$$\text{Average Collection Period} = \frac{\text{Accounts Receivable}}{\text{Sales}} \times 365$$

In the present example this ratio is  $(365)(\text{N2m}/\text{N24m}) = 30.4$  days. Normally in accounting terms this would be rounded to 31 days.

### 3.7 The Cash Operating Cycle

Having introduced some of the ratios associated with current asset and liability management, it is useful to return to cash management and consider the cash operating cycle. This indicates the net time interval between cash inflows from goods sold and cash outflows for the purchase of resources. It is a measure of the length of time a company has funds tied up in working capital, an increase (decrease) in the cycle indicating an increase (decrease) in working capital needs.

A company's cash operating cycle is equal to:

- the average number of days a given inventory is held, measuring the length of time required to purchase and sell its product: plus

- the average collection period on its account receivable, measuring the length of time required to collect sales revenue; minus

**Table 3.5: The cash operating cycle**

Annual	N100.000	
Cost of goods sold	N40.000	
	Balance	Ratios
Inventory	5000	Inventory <i>Cost of goods</i> <b>N40.000</b> 8
		Inventory 5000
Accounts	10,000	<i>Receivable Sales</i> 100.000 10
Receivable		Turnover Receivables 10.000
Account	5000	<i>Debtor Sales</i> 100.000 10
Payable		Turnover Account Payable 10.000

- \* The average period of its accounts payable, measuring the length of time payments can be deferred on its purchase of resources.

This is, the cash operating cycle is equal to:

$$365 \left[ \frac{1}{\text{Inventory Turnover Ratio}} + \frac{1}{\text{Receivables turnover Ratio}} - \frac{1}{\text{Debtor Turnover Ratio}} \right]$$

Since each of these ratios measures, respectively, the number of times in a year that inventory, accounts receivable and accounts payable are 'turned over', dividing each ratio into the number of days in a year measures the average number of days each of these components of working capital is held.

To illustrate, consider a company which has average annual sales of £100,000 at an average annual cost of goods sold of £40,000. given the average balances in its inventory, accounts receivable and accounts payable and the relevant ratios, the cash operating cycle is:

$$365 \left[ \frac{1}{8} + \frac{1}{10} - \frac{1}{10} \right] = 365 [0.125 + 0.1 - 0.1] = 45.6 \text{ days}$$

If for example, the company reduced its investment in accounts receivable there would be, all other things being equal, an improvement in liquidity as measured by the cash operating cycle. Assuming accounts receivable are reduced to £6000, the receivable turnover ratio falls to £100,000/£6000 = 16.7. Thus, the cash operating cycles reduced from 45.6 days to 31 days: that is, in the latter case:

$$365 \left[ \frac{1}{8} + \frac{1}{16.7} - \frac{1}{10} \right] = 365 [0.125 + 0.06 - 0.1] = 365[0.085] 31 \text{ days}$$

## **Overall Working Capital Policy**

To bring this unit to a close it is important to consider the overall policy which a company might adopt in respect of its working capital. There are two aspects of this, one involving the investment decision and the other involving the financing decision. The former is examined first.

### **Current Asset Policy**

In an earlier part of this unit, when discussing cash and marketable securities, the importance of the risk-return relationship was identified. It was argued that the benefits of liquidity, in terms of producing low risk but low returns, should be weighed against relatively higher returns but higher risk produced by investing in long-term physical or fixed assets.

This risk-return principle applies to a company's investment decision in respect of its overall current assets. In this context, there are three alternative strategies which can be adopted. They involve average, conservative and aggressive approaches to risk management. Under the conservative strategy, relative to the average, there is a relatively high proportion of investment in current assets. This produces below average risk and below average total return. Under the aggressive strategy, relative to the average, there is a relatively low proportion of investment in current assets, producing above average risk and above average total returns.

The choice of strategy varies from industry to industry depending on the nature of the product and/or service being supplied and, among other factors on sales variation and the degree of operating leverage. Sales variation and operating leverage determine business risk and hence the variation in net cash flows. The overriding objective should be to determine the ratio of current assets to total assets which maximizes the total market value of a company.

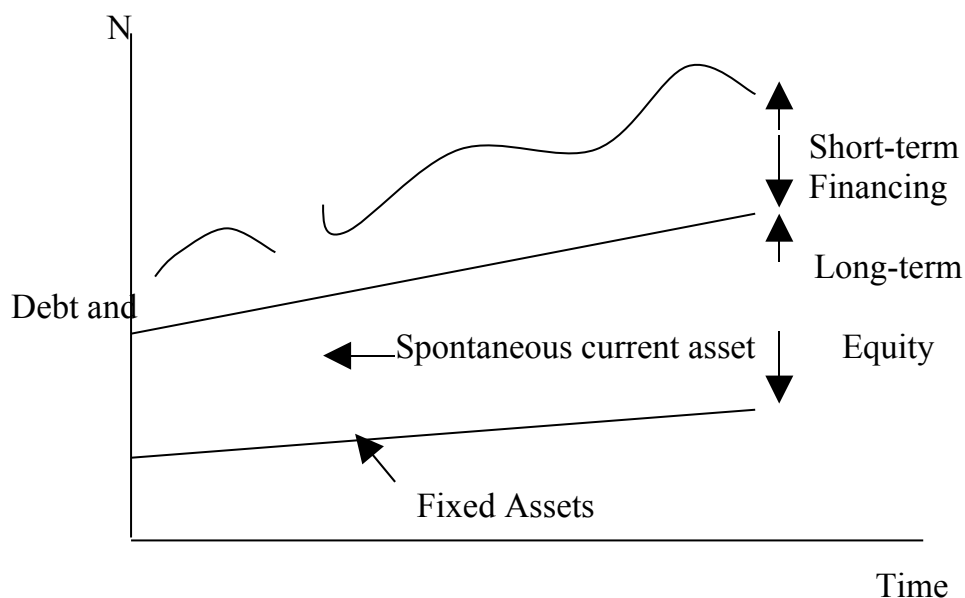
### **Current and Long-Term Liability Policy**

Once the investment decision has been made, strategies for financing current assets must be addressed. This strategies involve choosing the term structure of liabilities appropriate to a given term structure of assets. The analysis is aided by considering a company's cumulative capital requirement at a given point in time, that is, the total capital necessary to fund a company's total investment. The cumulative capital requirement is determined by fixed, or long-term, assets, permanent assets; and spontaneous, or fluctuating current assets.

The division of current assets into permanent spontaneous components arises to the extent that a company can predict its long-term trend in sales. To the extent that it can do this, the proportions of its current assets necessary to support this trend can be considered to be long-term and, therefore, effectively permanently. The remaining proportions of current asset investments (in cash and marketable securities, inventories and accounts receivable) are spontaneous. They are spontaneous in that these current assets fluctuate to facilitate unanticipated changes in sales and as a result of the innate variation in the current asset components themselves. The cumulative capital requirement is illustrated in figure 3.1.

There are three alternative financing strategies which involve average, aggressive and conservative hedging approaches to financial risk management.

The average hedging approach consists of marching the maturity structure of assets and liabilities, on the assumption that permanent current assets can be treated as long-term investments. Here all fixed and permanent current assets are funded by long-term debt and equity, with spontaneous current assets being financed by short-term debt and accounts payable. This approach exposes a company to 'average' risk with 'average' expected returns.



**Figure 3.1: The Cumulative Capital Requirement and Average Hedging**

### 3.8 Forecasting Working Capital

A company may occasionally require a forecast of the amount of working capital needed to finance an increase in output or introduction of a new product. In preparing a working capital forecast, the factors to be considered include anticipated production level and production costs, length of production cycle, planned stock levels and credit terms.

#### Illustration:

The following information relates to XYZ plc.

Turnover	N3million
Cost as a percentage of turnover:	
Direct material	30%
Direct labour	25%
Variable overhead	10%
Fixed overhead	15%
Selling and distribution overhead	5%

Note: On average, debtors take  $2\frac{1}{2}$  months before payment. Raw materials are in stock for 3 months. Work-in-progress represents 2 months half produced goods. Finished goods represent one month production.

Credit is taken as follows:

Direct material	2 months
Direct labour	1 week
Variable overheads	1 month
Fixed overheads	1 month
Selling and distribution overheads	$\frac{1}{2}$ a month

Work in progress and finished goods are valued at material, labour and variable expense cost.

You are required to compute the working capital requirement of XYZ plc (assume 50 working weeks in a year)

Hint. Estimate the total amount of debtors and creditors.

#### **Solution**

- I. Debtors  $= 2\frac{1}{2}/12 \times \text{N}3\text{m} = \text{N}625,000$   
 II. Direct materials cost  $= 30\% \times \text{N}3\text{m} = \text{N}900,000$   
 III. Stock of raw materials  $= 3/12 \text{ N}900,000 = \text{N}225,000$   
 IV. Valuation of Work-in-progress:

Raw material = $2/12 \times \text{N}900,000$	= N150,000
Direct labour = $2/12 \times \text{N}750,000$	= N 62,000
Variable overhead = $2/12 \times 0.5 \times \text{N}300,000$	= N <u>25,000</u>
Total	= <u>N237,500</u>

#### V. Valuation of Finished Goods:

Raw materials = $1/12 \times \text{N}900,000$	= N75,000
Direct labour = $1/12 \times \text{N}750,000$	= N62,500
Variable overhead = $1/12 \times \text{N}300,000$	= <u>N 25,000</u>
Total	= <u>N162,500</u>

$$\text{Total Stock} = \text{N}(225,000 + 237,500 + 162,500) = \text{N } 625,000$$

#### VI. Creditors:

Direct materials = $2/12 \times \text{N}900,000$	= N150,000
Direct labour = $1/50 \times \text{N}750,000$	= N 15,000
Variable overhead = $1/12 \times \text{N}300,000$	= N 25,000
Fixed overhead = $1/12 \times 450,000$	= N 37,500
Selling and distribution = $1/2 / 12 \times \text{N}150,000$	= <u>N 6,250</u>
	<u>N233,750</u>

Therefore working capital required = Stock + Debtors – Creditors

$$\begin{aligned} \text{W.C.} &= \text{N}(625,000 + 625,000 - 233,750) \\ &= \text{N}1,016,250 \end{aligned}$$

## 4.0 CONCLUSION

In conclusion, this unit critically discussed cash flow statements, income statement sources and uses of cash, working capital management in terms of cash management, inventory management and how to forecast working capital for an organization.

## 5.0 SUMMARY

In summary, cash flows can be classified into: [Operational cash flows](#): Cash received or expended as a result of the company's core business activities; [Investment cash flows](#): Cash received or expended through [capital expenditure](#), investments or acquisitions. [Financing cash flows](#): Cash received or expended as a result of financial activities, such as receiving or paying loans, issuing or repurchasing stock, and paying [dividends](#). All three together are necessary to reconcile the beginning cash balance to the ending cash balance.

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Differentiate between cash inflows and outflows?
2. With appropriate illustrations discuss cash operating cycle?

## **7.0 REFERENCES/FURTHER READINGS**

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Ross, Stephen A, Westerfield, R. W. and Jordan, B. D. (2003). *Fundamental of Corporate Finance*. USA: McGraw-Hill Irwin.



## MODULE 3

Unit 1	Financial Cost and Benefits Analysis
Unit 2	Evolving of Financial Plan (Budgeting)
Unit 3	Techniques and Tools of Analysis
Unit 4	Breakeven Analysis
Unit 5	Budgeting Techniques

## UNIT 1 FINANCIAL COST AND BENEFITS ANALYSIS

### CONTENTS

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2.0	Objectives
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### 1.0 INTRODUCTION

Cost-benefit analysis (CBA or COBA) is a major tool employed to evaluate projects. It provides the researcher with a set of values that are useful to determine the **feasibility of a project** from an economic standpoint. Conceptually simple, its results are easy for decision makers to comprehend, and therefore enjoys a great deal of favor in project assessments. The end product of the procedure is a benefit/cost ratio that compares the total expected benefits to the total predicted costs. In practice, CBA is quite complex, because it raises a number of assumptions about the scope of the assessment, the time-frame, as well as technical issues involved in measuring the benefits and costs.

Before any meaningful analysis can be pursued, it is essential that an appropriate framework be specified. An extremely important issue is to define the spatial scope of the assessment. Transport projects tend to have negative impacts over short distances from the site, and broader benefits over wider areas. Thus, extending a runway may impact severely on local residents through noise generation, and if the evaluation is based on such a narrowly defined area, the costs could

easily outweigh any benefits. On the other hand, defining an area that is too broad could lead to spurious benefits. “The aim of the study area definition should be to include all parts of the transport network which are likely to include significant changes in flow, cost or time as a result of the project” (UN 2003, 17).

Because transport projects have long-term effects, and because the analysis is carried out on a real term basis, the benefits and costs must be assessed using specific and pre-determined parameters. For example, when is the project start date, when will it be completed, over what period of time will the appraisal run, and what discount rate will be used to depreciate the value of the costs and benefits over the appraisal period? These and other parameters must be agreed upon. Costs and benefits are presented in nominal values, i.e. monetary values of the start year and discounted for [inflation](#) over the project period. Because most transport projects are assessed for a 30-year period employing different discount rates may influence greatly the outcomes.

**Costs** associated with the project are usually easier to define and measure than benefits. They include both investment and operating costs. Investment costs include the planning costs incurred in the design and planning, the land and property costs in acquiring the site(s) for the project, and construction costs, including materials, labor, etc. Operating costs typically involve the annual maintenance costs of the project, but may include additional operating costs incurred, as for example the costs of operating a new light rail system.

**Benefits** are much more difficult to measure, particularly for transport projects, since they are likely to be diffuse and extensive. Safety is a benefit that needs to be assessed, and while there are complex issues involved, many CBA studies use standard measures of property savings per accident avoided, financial implications for reductions in bodily injury or deaths for accidents involving people. For example, Transport Canada uses \$1.5 million in 1991 dollars for each fatality saved. One of the most important sets of benefits are efficiency gains as a result of the project. These gains might be assessed by estimating the time savings or increased.

Many other elements relating to social impacts, aesthetics, health and the environment are more difficult to assess. The latter, in particular, is a major factor in contemporary project assessment, and usually separate environmental impact analyses are required. Where possible these factors must be considered in CBA, and a variety of measures are used as surrogates for environmental benefits and costs. For example, the commercial losses of habitat destruction and property damage can be estimated. For example, the difference in the values of properties

adjacent to airports and those further away are used to assess the costs of noise.

## 2.0 OBJECTIVES

At the end of this unit student will be able to:

- differentiate between costs and benefits of a project
- explain the theory of costs and benefits
- state the importance of costs and benefits
- state the application of costs and benefits
- discuss the various methods of estimating costs.

## 3.0 MAIN CONTENT

### 3.1 *Theory of Cost-Benefit Analysis*

Cost-Benefit Analysis is an economic tool to aid social decision-making, and is typically used by governments to evaluate the desirability of a given intervention in markets. The aim is to gauge the efficiency of the intervention relative to the status quo. The costs and benefits of the impacts of an intervention are evaluated in terms of the public's *willingness to pay* for them (benefits) or willingness to pay to avoid them (costs). Inputs are typically measured in terms of opportunity costs - the value in their best alternative use. The guiding principle is to list all of the parties affected by an intervention, and place a monetary value of the effect it has on their welfare *as it would be valued by them*.

The process involves monetary value of initial and ongoing expenses vs. expected return. Constructing plausible measures of the costs and benefits of specific actions is often very difficult. In practice, analysts try to estimate costs and benefits either by using survey methods or by drawing inferences from market behaviour. For example, a product manager may compare manufacturing and marketing expenses to projected sales for a proposed product, and only decide to produce it if he expects the revenues to eventually recoup the costs. Cost-benefit analysis attempts to put all relevant costs and benefits on a common temporal footing. A discount rate is chosen, which is then used to compute all relevant future costs and benefits in present-value terms. Most commonly, the discount rate used for present-value calculations is an interest rate taken from financial markets. This can be very controversial - for example, a high discount rate implies a very low value on the welfare of future generations, which may have a huge impact on the desirability of interventions to help the environment, and so on. Empirical studies have suggested that in reality, peoples' discount

rates *do* decline over time. Because CBA aims to measure the public's true willingness to pay, this feature is typically built into studies.

During cost-benefit analysis, monetary values may also be assigned to less tangible effects such as the various risks which could contribute to partial or total project failure; loss of reputation, [market penetration](#), long-term enterprise strategy alignments, etc. This is especially true when governments use the technique, for instance to decide whether to introduce business [regulation](#), build a new road or offer a new drug on the state [healthcare](#). In this case, a value must be put on human life or the [environment](#), often causing great controversy. The cost-benefit principle says, for example, that we should install a guardrail on a dangerous stretch of mountain road if the dollar cost of doing so is less than the implicit dollar value of the injuries, deaths, and property damage thus prevented (R.H. Frank 2000).

Cost-benefit calculations typically involve using [time value of money](#) formula. This is usually done by converting the future expected streams of costs and benefits to a [present value](#) amount.

### 3.2 Importance of Cost-Benefit Analysis

Cost-benefit analysis is used for determining which alternative is likely to provide the greatest return for a proposed investment. Sometimes referred to as cost-effectiveness analysis, it is relevant to businesses as well as to not-for-profit entities and governmental units.

A business might find it helpful to use cost-benefit analysis to determine if additional funds should be invested in a facility in the home country or in another country. A community not-for profit organization that provides a variety of programmes for children might use cost-benefit analysis to assist management in determining which activities will provide the most services for the costs specified. A federal governmental agency might use cost-benefit analysis to determine which of several projects planned for the national parks is likely to be most used, given the costs, by interested citizens.

Because resources such as money and time are limited, an organization usually cannot undertake every project proposed. To decide whether to undertake a project, decision makers [weigh](#) the benefits from the project against the cost of the resources it requires, normally approving a project when its benefits exceed its costs. Cost-benefit analysis provides the structure and support for making such decisions.

Benefits increase the welfare of the organization. Some benefits are monetary benefits, such as the dollar amount of cash inflows from

additional sales of a product or the saving in cash outflows that a project enables. Other benefits are important but harder to [quantify](#). For example, a project may increase customer [satisfaction](#); increased customer satisfaction may increase future sales, but the exact relationship between sales and satisfaction is often hard to specify.

Costs are the outlays or expenditures made in order to obtain a benefit. Many costs are measured monetarily, such as the cost of buying a new machine or of hiring an additional employee.

### **3.3 Applications of Cost-Benefit Analysis**

#### **Cost-Benefit Analysis in Business**

A cost-benefit analysis is straightforward when all costs and benefits are measurable in monetary terms. Assume that Company A must decide whether to rent an ice cream machine for the summer for \$900. The ice cream machine will produce additional cash inflows of \$1,000 during the summer. The benefit of additional cash in-flows (\$1,000) exceeds the additional cost (\$900), so the project should be undertaken. Not all cost-benefit analyses are this simple, however. If the benefits and costs occur in different time periods, it may be necessary to discount the future cash flows to their equivalent worth today.

In another example, cost savings is a benefit. Assume that Company B makes about 100,000 photocopies a year. Company B does not have its own copy machine and currently pays 4 cents per copy, or \$4,000 a year, to Copycat Copiers. Company B can lease a copy machine for \$2,500 a year. It must also pay 2 cents per page for paper for the leased machine, or \$2,000. In this example, the cost of leasing the machine and buying paper (\$2,500 \$2,000 \$4,500) exceeds the benefit of saving the \$4,000 normally paid to Copycat Copiers. Company B should continue to use Copycat Copiers for its photocopies. However, Company B must have a pretty good estimate of the number of copies it needs to be comfortable with its decision. If Company B needs 150,000 copies this year instead of 100,000, the cost of the leasing the machine and buying paper (\$2,500 \$3,000 \$5,500) is cheaper than the \$6,000 (150,000 \$0.04) savings in fees to Copycat Copiers.

A third example involves a project with benefits that are difficult to quantify. Assume that Company C is deciding whether to give a picnic costing \$50,000 for its employees. Company C would receive the benefit of increased employee morale from the picnic. Better employee morale might cause employees to work harder, increasing profits. However, the link between increased morale and increased monetary profits is [tenuous](#). The decision maker must use his or her judgment to

compare the nonmonetary benefit to the monetary cost, possibly deciding that increased employee morale is worth the \$50,000 cost but would not be worth a \$100,000 cost.

In the preceding examples, cost-benefit analysis provided a framework for decision making. The range of objectivity related to measurement of the factors is typical. Techniques used in business as a basis for determining costs and benefits, such as return on investment, are generally [quantifiable](#) and thus appear to be objective. However, it is not uncommon for [qualitative factors](#) to enter into the decision-making process. For example, providing a product that individuals with limited incomes will be able to purchase may not provide the highest monetary return on investment in the short run, but might prove to be a successful long-term investment. Careful decision makers attempt to deal with a difficult-to-quantify factor in as objective a manner as possible. However, cost-benefit analysis in most situations continues to introduce measurement problems.

### **Cost-Benefit Analysis in Non-Business Entities**

Cost-benefit analyses are also common in non-business entities. Boards of not-for-profit organizations establish priorities for their programmes, and such priorities often specify desired program outputs. For example, assume a not-for-profit organization is interested in reducing the level of illiteracy among the citizens of a rural community in a state that has one of the lowest per- capita incomes in the United States. As alternative programmes for those who need to learn to read are considered, there will be cost-benefit analyses that focus on a number of factors, including the extent to which a particular programme can attract those who are [illiterate](#). A programme in the downtown area of a small town might be considered because a facility is available there at low cost and that low cost is appealing. Focus on cost is not sufficient, however. When benefits are considered, it might become clear that those who are eager for such a program do not have cars and that there is no public transportation from where they reside to the center of the small town. Further consideration of relevant factors and of alternatives, undertaken in good faith, should result in cost-benefit analyses that provide valuable information as the agency makes decisions.

At all levels of government in the United States, cost-benefit analyses are used as a basis for allocating resources for the public good to those programmes, projects, and services that will meet the expectations of citizens. For example, decision makers at the federal level who have policy responsibility for environmental standards, air-quality rules, or services to the elderly often find information from cost-benefit analyses to be critical to the decision-making task.

### 3.4 Methods of Estimating Cost

There are four principal methods of estimating cost:

#### i. Reference to Similar Projects

Reference to any similar project previously carried out by the project sponsors or by enterprises in the same industry is the simplest method of costing; the only basic condition being that the project be comparable in every respect to the previous one. This method has the advantage that it provides a realistic basis for costing as it allows an exhaustive checklist of all the ancillary equipment and facilities which previous experience has shown to be important.

When using this method it is important to ensure that the costs indicated are still valid. Changes which may be due to currency depreciation or and inflation must be noted.

It happens quite often that the capacity of the new project differs from that of the comparable earlier project. The problem of extrapolation then arises. A very rough and ready estimate indicating the orders or magnitude may be made by applying the “six-tenth factor” (OECD, 1968).

If  $S_A$  and  $S_B$  are the capacities of two plants A and B and  $K_A$  and  $K_B$  their respective investment costs, then

$$K_A/K_B = (S_A / S_B)^x \text{ where } x < 1$$

The coefficient ‘x’ represents economies of scale. For chemical engineering, it was suggested that the value of x should be 0.6. it is emphasized that the rule should be applied with caution. There are many kinds of industrial machinery that will not exhibit this relationship between area (cost) and volume (capacity).

#### ii. Enquiry from Possible Suppliers

Enquiries from possible suppliers are the safest way of obtaining the latest price of equipment. The only draw-back is that the prices indicated do not include cost of related facilities, transport and assembly with the result that the initial price has to be doubled in order to arrive at a figure for equipment erected or installed on site and in working order. For this reason, prices indicated should always be qualified by specific delivery terms, and conditions relating to erection or installation, and also the conditions of guarantee during the initial operating period should be

specified. A similar approach should be used with regard to suppliers of raw materials required for operating the project.

### **iii. Use of Published Tariffs, Surveys and Official Regulations**

Some costs may be laid down in official regulations or public tariffs e.g. water and electricity rates, guaranteed minimum wages and salaries, etc. Surveys, whether connected with the project or not may provide information about the real level of wages and salaries and other expenditure items such as average building costs, prices of certain raw materials etc.

### **iv. Use of Technical Experts**

Technical experts may have to be called in to provide the possible solution. The nature of their work puts them in a better position than anybody else for assessing prices which depend on characteristics of materials and equipment.

## **3.5 Measuring Benefits and Costs**

1. [Marketed Benefits and Costs](#)
2. [Non-Marketed Direct Benefits and Costs](#)
3. [Non-Marketed Indirect Benefits and Costs](#)

A properly constructed cost-benefit analysis will attempt to measure the change in economic welfare associated with all costs and all benefits uniquely generated by a project. In general, these will fit into one of three categories: (1) marketed (direct) benefits and costs, (2) non-marketed direct benefits and costs, and (3) non-marketed indirect benefits and costs. For benefits, we attempt to measure the willingness to pay by all affected consumers for the relevant project benefits. The rationale for doing so derives from applied economic welfare analysis. This approach argues that economic welfare derives from preference satisfaction and that preference satisfaction is reflected by the consumer's willingness to pay.

More specifically, economists infer willingness to pay for direct benefits and costs by observing choices made in markets or by observing other choices to spend dollars to facilitate direct consumption of the resource. This is said to measure preferences revealed by choices, or simply to measure revealed preferences. For non-marketed, indirect benefits and costs, stated preference estimates derived from survey research are employed. For costs, we attempt to measure the opportunities foregone (opportunity costs) due using the economic resources (land, labor, materials, etc.) in the project rather than in some other use. For direct



private costs, market prices of resources are used. Non-marketed costs, tend to be treated as benefits foregone, and are estimated exactly as are benefits. For a more detailed discussion of benefits and costs, in non-technical terms, the reader is referred to the Resources for the Future publication "[Cost-Benefit Primer.](#)"

## **1. Marketed Benefits and Costs**

Marketed benefits, also referred to as private benefits, are measured as the sum of willingness to pay by consumers for the new quantity of product produced by the project being evaluated. For example, assume that the construction of a marina produces 10,000 days of new available dockage. The question then becomes, how to value this dockage.

In the private sector, the firm would simply measure a price times quantity dollar value, but because public sector decision making seeks to take into account changes in welfare, rather than changes in revenues, a somewhat different approach is taken. The accepted approach for measuring the willingness to pay for the new dockage (and for other privately marketed goods) is to measure the market demand curve for dockage and to calculate the incremental price that consumers' would be willing to pay for the dockage. In general, this would not be a constant price, but rather it would -clearing (or marginal) price is reached, a price that would on average rent out all available dock space. Thus, while all renters may pay the same market clearing price, some might have been willing to pay a higher price than others, but were not required to do so. In fact, each renter may have been willing to rent at a different price, but the marina may not have been able to charge each a different price. Observing the price paid tells the analyst a lower bound for benefits; that is, if the consumer did not receive benefits at least equal to the price paid, he or she would not have purchased the good. Adding back an amount the consumer would have been willing to pay adjusts the total revenue measure obtained from multiplying the total quantity rented by the price to affect more accurately the increase in economic welfare as a result of the marina. This concept is referred to as consumers surplus within the economics literature. It is used to value all benefits when a demand curve can be estimated. This same approach is used for estimating welfare for non-marketed direct and indirect benefits.

The private costs associated with the project, unlike the benefits, are typically measured at market prices. This reflects the fact that factor inputs, like land, labor and materials tend to be much more substitutable and therefore supplied at roughly constant prices. Few projects are by themselves large enough to cause changes in prices through project activities, and, hence, the assumption of constant prices is reasonable.

The issue of under utilized resources is a bit more problematic, however. Local administrators are typically enthusiastic about new jobs created economic developed, private or public. National administrators, on the other hand, recognize that the benefits are not unique to the project, because they would occur anywhere a project was undertaken, and would likely be similar for quite different projects or roughly equal magnitude. The only question to a national decision maker would be whether special weight would be given to economic development in particular areas as a matter of policy. For those local administrators interested in exploring ways to measure new jobs created by a project, the Department of Commerce, [Office of Business and Economic Research](#) provides multipliers and other tools of analysis.

## **2. Non-Marketed Direct Benefits and Costs**

A large number of natural and environmental resources are consumed directly, but are not purchased in markets. Examples, include fishing in a mountain stream, enjoying a panoramic view, living in a community or neighborhood with clean (or dirty) air, or working in an occupation that provides opportunities to enjoy increased (decreased health). We note that environmental "dis-amenities" as well as amenities can come into play.

As it turns out, individuals who consume these amenities and dis-amenities often leave behavioral "footprints" from which revealed preferences can be recovered using statistical methods. For example, some individuals work in highly desirable occupations, like forest rangers, and as a consequence receive lower wages than they would otherwise receive. Symmetrically, workers in very undesirable occupations often received wage premia. A statistical tool called hedonic analysis can be used to estimate these wage differentials. In simple terms, a forecasting model is developed for various occupations, such that the impacts of job attributes such as skills, education, as well as desirable and undesirable job features on wages can be estimated. Hedonic models are also often used to measure the impacts of favorable or unfavorable environmental conditions on property values. For example, the impacts of a view could be isolated statistically, by controlling for size of house, size of lot, construction, and other features. In other cases, a travel cost approach is used to infer willingness to pay for an environmental amenity. For example, costs incurred by fishers can be observed and related to stream attributes, such as beauty, isolation, average catch, average sized catch, and the like. By isolating other affects statistically, it is possible to infer the willingness to pay for attributes of many natural attractions, like national parks, seashores, lakes and mountains.

These approaches are referred to as revealed preference measures because they infer willingness to pay as revealed by consumer choices. From them, demand schedules can be estimated and consumer surplus measured.

### **3. Non-Marketed Indirect Benefits and Costs**

Non-marketed indirect benefits and costs arise not because of direct use of a resource, but rather because individuals place value on the "existence" of the resources. For example, many people have never seen the redwood forests, but have willingness to pay to see them preserved. Likewise, people who will never encounter a baby seal outside of a zoo may have strong feelings, backed by willingness to pay, concerning their harvest for use as furs. These values are appropriate costs and benefits. The challenge lies in measuring these values in meaningful scientific ways, that is, ways that can be validated and replicated.

In general, because there are no behavioral footprints from which to infer value survey based approaches are used to derive indirect values. The most commonly applied approach is called contingent valuation analysis wherein a hypothetical, or "contingent," choice is made that is designed to reveal an individual's willingness to pay. Typically, these analyses present detailed scenarios to respondents that include information about the programme under consideration, what it hopes to accomplish, how it will be paid for, and over what time period actions will take place. Various formats are then employed to obtain a contingent value that is an estimator of actual willingness to pay. Some analysts use a family of approaches termed conjoint analysis to seek similar information. These are termed stated preference measures because respondents are asked to state their willingness to pay.

Stated preference measures have been criticized for a large number of reasons, some quite esoteric and others quite practical. Some question, for example, if individuals actually have preferences for a diverse and nearly limitless set of resources that can be estimated in this way. Others question the sensitivity to the quality of the programme being purchased. Still others concern themselves, that respondents, sensing that their answers may affect policy, respond strategically with very large or with zero responses. Analysts are making some headway on overcoming these problems. A good review of these issues can be found in a book by NCEDR researchers [Bjornstad and Kahn](#).

These approaches have also been criticized by those who question whether or not preference satisfaction is a useful approach to making environmental decisions. These critics suggest that environmental decision making is essentially an ethical process that should be removed

from economic considerations. At the extreme, these observers might argue that a clean environment is a "right" and that no expense should be spared in this pursuit. The difficulty with such criticism is that it flies in the face of scarce resources and the need to make hard decisions. Ultimately, some mechanism must provide guidance as to priorities, proportions and overall costs of programmes that must compete with other activities for funding. In addition to cost-benefit analysis approaches such as citizen juries, focus groups, decision analysis, risk analysis, and many other approaches have been proposed to help decide these difficult issues.

A more pragmatic concern, however, is just whose preferences should count when the sub-national decision maker confronts an issue. Certainly it is informative that other citizens in far away regions value the actions of others in other regions, but they are unlikely to support these activities financially. A good rule of thumb is that the citizens in the jurisdiction that will make economic sacrifices for the project should be included.

#### **4.0 CONCLUSION**

In the course of our study in this unit we were able to differentiate between the costs and benefits of a project, identified the theory of costs and benefits, examined the importance of costs and benefits, stated the application of costs and benefits and finally enumerated various methods of estimating costs. Thus, cost-benefit analysis is a major tool employed to evaluate projects. It provides the researcher with a set of values that are useful to determine the feasibility of a project from an economic standpoint. Conceptually simple, its results are easy for decision makers to comprehend, and therefore enjoys a great deal of favor in project assessments.

#### **5.0 SUMMARY**

In summary, this unit discussed theory of cost-benefit analysis, importance of cost-benefit analysis, application of cost benefit analysis in business, non-business entities, and finally methods of estimating/measuring cost and benefits.

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. What do you understand by cost benefit analysis of a project? Discuss the importance of cost benefit analysis?
2. State and discuss four methods of estimating costs in a proposed project?

## 7.0 REFERENCES/FURTHER READINGS

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## **UNIT 2      EVOLVING OF FINANCIAL PLAN (BUDGETING)**

### **CONTENTS**

- 1.0    Introduction
- 2.0    Objectives
- 3.0    Main Content
  - 3.1    Estimating Sales Revenue
  - 3.2    Estimating Operating and Maintenance Costs
  - 3.3    Estimating Project's Financial Profitability
- 4.0    Conclusion
- 5.0    Summary
- 6.0    Tutor-Marked Assignment
- 7.0    References/Further Readings

### **1.0    INTRODUCTION**

The purpose of a financial plan among other things is to determine the financing of an enterprise. It examines the internal sources of finance namely: forecast of net profit after tax, depreciation and sale of used equipment; and attempt to balance these against financing requirements such as investments, expected increase in working capital, and allowance for unforeseen requirements.

### **2.0    OBJECTIVES**

At the end of this unit students will be able to:

- estimate sales revenue from the proposed project
- estimate operating and maintenance costs
- estimate project financial profitability.

### **3.0    MAIN CONTENT**

#### **3.1    Estimating Sales Revenue**

After considering the total investment requirements of the project the next is to start to prepare a budget of income and expenditure by which the worthwhileness of the project can be assessed. The income or earning of the project depends on the difference between the sales revenue and the operating costs. The sales revenue in turn depends on the volume of sales and the price which can be obtained for the product. Therefore, it is important to determine the volume of output and sales.

The physical volume of sales depends on:

- xi. the production capacities of the plant
- xii. the quality of the product
- xiii. the potential size of the market
- xiv. the state of competition , and
- xv. the price being asked for the product.

Therefore, estimating sales revenue is not a simple matter of multiplying full capacity output by the existing price. From many variables, it is necessary to construct alternative output-revenue models from which one is selected by judgment each year after production commences.

The volume of output is limited by the physical capacity of the plant. However, rated capacity should not be taken without question. The following considerations are important:

- i. It may be possible and practicable to operate the plant in two or three shifts. Therefore, the maximum possible output may be twice or thrice greater than rated capacity.
- ii. Capacity figures may not take into account the number of days the plant may be shut down e.g. for maintenance, public holidays etc.
- iii. Experience has shown that plants cannot be operated at full capacity from the beginning because of technical or teething problems. It may sometimes take up to three to five years to solve all problems which keep plants working below capacity. It is therefore realistic to assume that plant may achieve 50% capacity output in the first year, 75% in the second year and 90% in the third year.

Of course it is impossible to make any sound judgment as to the volume of the product which can be sold without taking price into account. The price elasticity of demand may provide information on the extent to which sales revenue will be affected by lowering or increasing prices. In the market analysis for the product of the project the size of the estimated market was that which apparently existed at the going price for the product.

In estimating sales revenue the prospective sales volume can be built up by counting on selling at a price lower than the going price. However, if there is no reason to doubt the ability of the enterprise to sell all it can produce at the existing price, there will be no point in lowering the price. Some judicious price cutting may be second way of introducing a

new brand name, or a new product, or overcoming initial resistance to a product due to quality differences. The revenue estimates should be broken down into local and foreign currency.

### 3.2 Estimating Operating and Maintenance Costs

Just as the estimates of sales revenue provide one side of the income forecast, the estimates of the operating costs provide the other. Each item of cost should be systematically analyzed on the basis of the sales volume previously arrived at as reasonable for each year.

As with the revenue estimates, the cost estimates should be broken down into local and foreign currency.

**Raw Materials:** The major cost item for most manufacturing enterprises is raw material. The quantity of raw material. The quantity of raw material required for a given volume of production is not difficult to estimate. For many manufacturing processes there is fairly well fixed percentage relationship between input and output quantity. So many tons of cotton give so many tons of yarn or so many tons of wheat give so many tons of flour.

**Operating Labour:** Operating labour costs are usually important in amount and use standards in advanced industrialized countries. It is obvious that this may not be safe because of lack of industrial culture, poor training and lack of experience. It is impossible to establish a good measure of the number of workers a pioneer plant should have. On the basis of experience, it can be observed that a first plant in a developing country will do well if it does not have more than twice or thrice the number of workers of a comparable plant in Europe or America. Having forecast the number and specification of workers, the average yearly labour cost must be forecast as well.

**Depreciation:** Depreciation represents an attempt to spread the cost of an asset over its useful operating life. Over the years that the cost of an asset is usable, the accumulation of the credits to the depreciation allowance should exactly equal the original cost of the asset, less any residual scrap value when it goes out of service. The problem with depreciation is to estimate the useful life of the asset.

**Amortization of Expenditures:** Similar to depreciation is amortization of expenditures for advance expenditures, intangibles and preliminary expenses.

**Interest Payments:** for the purpose of making realistic estimates of financial profitability, it is necessary to include the cost of interest on



borrowed funds. To do this, an estimate must be made as the amount or debt the project will have. It is well to assume that about half the project's total cost will be financed by long-term debt, and to allow in the cost estimates for interest payments on the amount of loan so indicated.

**Management Cost:** Adequate management must be allowed for. Usually, the minimum complement of key managerial people in a medium-sized plant will include the general manager, the production manager, the maintenance engineer, a production superintendent for each shift and probably for each major department, a chief accountant, a personnel officer, a sales manager. Salary rates must be realistic.

**Administrative and Sales Costs:** these should be provided for on a basis which takes into account the costs of setting up adequate accounting and administrative systems, and a sufficiently strong sales organization to develop the market for the product.

**Taxes:** these can be calculated quite accurately on the basis of established rates and estimated net profits before taxes.

**Contingency:** As in the case of capital cost estimates, an allowance of 10% should be made for unforeseen expenses.

### 3.3 Estimating Project's Financial Profitability

Having prepared the revenue estimates based on sales volumes for the different years, and having drawn up complete and cautious operating and maintenance cost forecasts, all that remains is to bring the two estimates together as a budget of income and expenditure in order to arrive at a forecast of net profits for each year.

#### Format of Operating Budget of Income and Expenditure

Production % of capacity	First Year (50%)	Second Year 75%	Third Year 90%
Revenue:			
Gross sales			
Less discounts			
Net sales			
Operation Costs:			
Direct Labour			
Supervision			
Direct Material			
Supplies			
Power and fuel			
Maintenance			
Rent			
Insurance			

Interest on Debt depreciation			
Gross Profit: Less selling and distribution R & D General Administration			
Net profit before tax Less tax			
Net Profit after Tax			

#### 4.0 CONCLUSION

In the course of our study in this unit we were able to explain budget as a document that expresses financial plan of proposed project in terms of estimating sales revenue, operating and maintenance costs and finally estimation of project's financial profitability.

#### 5.0 SUMMARY

In summary, this unit discussed project's budget by estimating sales revenue which depends on the production capacities of the plant; the quality of the product, the potential size of the market; the state of competition, and finally the price being asked for the product. While estimating operating and maintenance costs could be broken down to both foreign and local currency as raw materials, operating labour, depreciation, amortization of expenditures, interest payments, management costs, administrative and sales costs, taxes and finally, contingency. Also, estimates of project financial profitability is computed from net revenue over costs.

#### 6.0 TUTOR-MARKED ASSIGNMENT

1. State and discuss factors to be considered for estimating operating and maintenance costs?
2. What is a budget? Discuss factors upon which sales depend?

#### 7.0 REFERENCES/FURTHER READINGS

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## **UNIT 3      TECHNIQUES AND TOOLS OF ANALYSIS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
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### **1.0 INTRODUCTION**

Project analysis may be defined in several ways. Square and Van der Tak (1975) define it as “...one method of evaluating alternatives... It assesses the benefits and costs of a project and reducing them to a common yardstick”. Project analysis refers to the study carried out during any part of the project cycle, which is intended to clarify one or several aspects covered by the terms costs, benefits and feasibility. Project analysis may be defined as the compilation, processing, and critical examination of a variety of economic, financial and technical data in respect of a proposed capital investment with a view to determining whether its economic advantages and disadvantages justify the commitment or allocation of scarce resources. Project analysis is thus an investigative study carried out by or for a prospective investor to determine the worthwhileness of the investment and enable a decision to be taken whether or not to go ahead with the investment. The importance of project analysis lies in the fact that it enables scarce resources to be put into the most profitable or efficient uses by ensuring that (a) the project is technically sound, (b) it will provide a reasonable economic and or financial return, and (c) its objectives cannot be achieved by a less costly alternative. Project analysis thus covers investigations that are often referred to as technical and economic feasibility studies.

## **2.0 OBJECTIVES**

At the end of this unit students will be able to:

- explain project analysis and its objectives
- explain various techniques/tools of project analysis
- discuss the superiority of one technique over others
- compute for acceptance or rejection of a project proposal.

## **3.0 MAIN CONTENT**

### **3.1 Purpose of Projective Analysis**

The objective of projective analysis depends on the point of view of the entity for whom the analysis is undertaken. Project analysis may be carried out from the point of view of four entities:

- i. the private firm
- ii. the equity shareholders
- iii. the debenture holders; and
- iv. the nation or the economy as a whole.

The over-riding objective of the firm is to maximize profit: that is to use the optimum volume and combination of resources such that the difference between the discounted stream of economic value created by the project and the discounted stream of the value of resources utilized is maximum. It is simply a measure of the efficiency in the use of resources. The flows of both the output and the resources are valued at market prices, that is, the firm is concerned with the prices it can obtain for its products, and those it must pay for its labour, raw materials, finance, machinery and equipment, spare parts, power supplies, and others. It is little concerned with the benefits and costs it may cause for the economy as a whole, which do not enter into its profit and loss accounts. Thus, a firm is concerned only with the financial analysis and financial profitability of the project.

The equity shareholders are the owners of the business. They are the residual recipient of any profit made by the enterprise after all debt obligations have been settled. For this reason, they bear most of the risks associated with the project. The objective of the equity shareholders is therefore to maximize the financial return on their equity shares with all costs and benefits measured in financial terms, that is, using market prices. Thus, like the firm the equity shareholder is concerned only with financial profitability of the project and the return to equity.

Like the equity shareholders, the debenture holders are interested in the financial soundness and profitability of the project and its ability to pay its debts when due.

In the case of the nation, the objective of the economy as a whole is the maximization of the welfare of its citizens. Welfare maximization is translated into a number of operational objectives, three of which being (i) maximization of aggregate real output, this is usually referred to as the economic efficiency objective; (ii) a more equitable distribution of income and (iii) self-sufficiency objective which may be interpreted as autarky, or balance of international payments. These last two objectives are often referred to as social objectives.

The benefits and costs of a public sector project are defined and measured in relation to these objectives, and are valued by the use of shadow or accounting prices which are not generally observed. The benefits from these multiple objectives are then made commensurable and together with the costs, are summarized into the economic and social profitability index of the project. This analysis is commonly referred to as economic and social cost benefit analysis. Thus, the objective of project analysis from the nation's point of view may be regarded as the maximization of economic and social profitability.

However, the starting point of the economic and social analysis which is the financial analysis is very important. Financial profitability analysis is an essential part of economic and social cost-benefit analysis because a financially unprofitable project which is socially profitable would have to be subsidized if executed, or made financially profitable by protection. This would raise important issues involving the fiscal authorities. Without the financial analysis, the wide fiscal implications would not be known. Furthermore, foreign lenders usually generally insist on a financial profitability analysis as it offers some assurance of the security of their loan, even though they know that this is more affected by the soundness of government policies and the balance of payments position of the country.

## **3.2 Techniques/Tools of Project Analysis**

### **3.2.1 NPV and IRR**

Turning to the main appraisal techniques, the analysis begins by considering the NPV and IRR approaches, both of which are based on the discounting principles developed in Unit 2 on the Time Value of Money.

Obtaining the NPV of a project involves estimating its future net cash flows; discounting these at the appropriate opportunity cost of capital to obtain their present value; and subtracting the initial capital cost, or net investment outlay, at the beginning of the project. Formally,<sup>1</sup>

$$NPV = \sum_{t=1}^n \frac{NCF_t}{(1+r)^t} - I_0$$

Where,

NCF is the net cash flow received at the end of each year or period  $t$ ,  $t = 1, 2, \dots, n$ .

$r$  is the project's opportunity cost of capital.

$I_0$  is the net investment outlay in time zero

Expressing Equation 6.1 in terms of present value interest factors:

$$NPV = \sum_{t=1}^n (NCF_t / PVF_{tr}) - I_0$$

The IRR on a project is based on the NPV concept and is found by solving for the discount rate which makes the NPV on a project equal to zero. In a more formal sense the IRR is the discount rate which, if applied to the future NCF series, equates the present value of that series to the initial or net investment outlay.

$$NPV = \sum_{t=1}^n \frac{(NCF_t)}{(1+IRR)^t} - I_0 = 0$$

or

$$NPV = \sum_{t=1}^n \frac{(NCF_t)}{(1+IRR)^t} = I_0$$

### A Conventional NPV Schedule

To obtain a clearer understanding of these two methods, it is useful to consider the NPV schedule, defined in relation to a standard or conventional project. A conventional project is one which always generates positive future NCFs, subject to the usual initial negative net investment outlay.

Consider project B, detailed in Table 6.1, which has an initial net investment outlay of € 700 and which produces a series of NCFs over a subsequent five – year period. Given  $r$ , the NPV for this project is:

$$NPV = \frac{200}{1+r} + \frac{50}{(1+r)^2} + \frac{200}{(1+r)^3} + \frac{200}{(1+r)^4} + \frac{600}{(1+r)^5} - 700$$

**Table 9.1 Net Investment outlays and NCFs for three independent projects**

Year	Projects			
	A	B	C	
	€ s	€ s	€ s	
0	-200	Net Investment Outlay -700	-700	PVIFs @ r = 8 1.00
1	200			
2	500			
3	400			
4	600			
5	500			
NPV	-€ 287.30	€ 327.91	€ 598.25	
@ 8%	294%	21.29%	30.09%	
IRR				

As an illustration of the relationship between NPV and  $r$ , the following four discount rates are applied to project B: 0.00%, 10%, 20% and 25%. If the discount rate is zero the NPV is simply the sum of the future NCFs minus the initial net investment outlay, that is  $NPV = € 650$ . At  $r = 10\%$  the  $NPV = € 265.20$ ; at  $r = 20\%$  the  $NPV = € 24.15$ , and at  $r = 25\%$  the  $NPV = -€ 63.07$ . Thus, for this project, and its standard type, the NPV is inversely related to the discount rate: the higher the discount rate the lower the NPV.

From the NPV schedule in Figure 6.1, the IRR is clearly illustrated. Since the IRR is determined as the discount rate which makes the NPV of a project zero, the IRR always occurs where the NPV schedule of a conventional project crosses the horizontal axis. In the case of project B, this point is achieved at a discount rate of 21.29%. Appendix 6.1 demonstrates how an approximate estimate of the IRR can be obtained.

### 3.3 Selecting Independent Investments

Under the NPV investment selection rule, all independent projects are acceptable provided that, for each project I,

$$NPV \geq 0$$

That is, all independent projects which at the chosen discount rate have positive, or at minimum zero, NPVs should be accepted. A project with a negative NPV is automatically rejected. In the specific example of project B above, providing the opportunity cost of capital, or discount rate, is not in excess of approximately 21%, a positive NPV would occur and the project would be accepted.

The reasoning behind the NPV is straightforward. It measures the extent to which outflows and, therefore, the extent to which shareholder wealth will be increased if the project is accepted. A company is indifferent to a project with a zero NPV since the funds that a zero NPV projects generates are just capable of covering the project's net investment outlay and meeting the company's required rate of return. Zero NPV projects do not, however, make a net contribution to wealth. Projects with negative NPVs would reduce value, if accepted.

In general, under the IRR investment selection rule, all independent projects are acceptable provided that, for each project 1,

$$IRR_i \geq r$$

That is, only independent projects whose IRRs exceed, or at minimum are equal to, the cost of capital would be acceptable. In the specific example of project B, if the cost of capital is greater than 21.29%, the project would be automatically rejected. If the cost of capital is equal to, or below, this cost of capital the project would be acceptable. Since the IRR is determined from the NPV schedule, its accept reject decision rule has implication for wealth creation similar to NPV. Generally, when the IRR exceeds the cost of capital,  $NPV > 0$ ; when it falls below it,  $NPV < 0$ . There are, however, some problems with applying the IRR rule to be discussed in the next section.

To illustrate the above two investment appraisal rules, consider all three independent projects in Table 6.1 and assume an opportunity cost of capital of 8%. The PVIFs at  $r = 8\%$  are given in the final column of the table. The NPVs of projects B and C are positive and both would be accepted; however, with a negative NPV, project A would be rejected. Similarly, projects B and C would be accepted using the IRR decision rule since each one's IRR exceeds the cost of capital of 8%. Project A would be rejected, however, since its IRR is less than 8%.

**Table 9.2 Mutually exclusive projects are incremental cash flows**

	<i>Mutually Exclusive Projects</i>		<i>Incremental project</i>
	<b>D</b>	<b>E</b>	<b>Z</b>
	€ s	€ s	€ s
		Net Investment Outlay	
0	-800	-800	0.00
		Net Cash Flows	
1	100	400	-300.00
2	200	300	-100.00
3	300	100	100.00
4	400	400	0.00
5	1000	500	500.00
NPV			
@ 8% IRR	€ 597.42	€ 541.26	€ 56.16
	25.08%	30.35%	12.69%



One of the advantages of using NPV is that it conforms to what is referred to as the value additivity principle, since the overall NPV of a set of independent projects is simply the sum of the individual project NPVs. In the present example the overall NPV of accepting projects B and C is:  $\text{€}327.91 + \text{€}587.25 = \text{€}915.16$ .

### 3.4 The Technical Superiority of NPV

For technical reasons the NPV investment selection rule is superior to the IRR rule, especially in a situation where a choice has to be made between a set of mutually exclusive projects.

In the mutually exclusive case, when using NPV, the project with the highest positive NPV is chosen. Under the IRR method, the project with the highest is chosen, provided the project's IRR is at least equal to the opportunity cost of capital. If, for example, the projects in Table 6.1 were mutually exclusive, instead of independent, project C would be selected by both methods. In the case of mutually exclusive projects, however, a straight application of the IRR method can produce an incorrect project choice.

This is exemplified in Table 6.2, where the net investment outlays and future NCFs are recorded for two mutually exclusive projects: D and E. The discount rate is 8% which, assuming certainty and perfect capital markets, is the market determined opportunity cost of borrowing and lending.

If the two projects in Table 6.2 had been independent there would be no ambiguity, since both projects would have been acceptable using either NPV or IRR. Both projects have positive NPVs and each project's IRR exceeds the opportunity cost of capital. Since the two projects are mutually exclusive, however, there is an obvious problem. Under the NPV rule, project D with its higher NPV would be chosen in preference to project E. Using the IRR rule, project E with its higher IRR would be chosen in preference to project D. The correct choice is made on the basis of NPV.

The conflict between the two decision rules arises because, in diagrammatic terms, the NPV schedules of two projects cross over. This is demonstrated in Figure 6.2 where the NPV schedules for these two projects are sketched. The cross over point occurs at a discount rate of 12.69%. If the opportunity cost of capital had been above 12.69%, the NPV method would have yielded the same project choice as the IRR method. The opportunity cost of capital of 8% is below this, giving rise to alternate choices under each selection method. The problem is that,

while NPV changes as the opportunity cost of capital changes, the IRR is constant and independent of the cost of capital.

### **Non–Discounting Appraisal Method**

There are two other prominently used methods of investment appraisal, the Pay – Back (PB) and the Accounting Rate of Return (ARR). These methods, which do not take the time value of money into account, are examined next.

#### **Pay Back**

The PB method of appraisal is based on the number of periods taken for the future NCFs on a project to pay back the initial net investment outlay. Normally, in formulating PB decision rules a maximum pay back period,  $PB^{\max}$ , is specified.

All independent projects under consideration are acceptable providing that, for each project  $i$ ,

$$PB \leq PB^{\max}$$

To illustrate, consider the four projects specified in Table 6.4. If these are independent, and  $PB^{\max}$  has been set at four years, project F will be rejected, and the other projects accepted. Under the NPV decision rule, however, with a discount rate of 10%, project I would be rejected but project F accepted. If, alternatively, the four projects are assumed to be mutually exclusive, project H, with the smallest PB of three years, would be the preferred option. Under the NPV decision rule, however, project F would be preferred.

The PB method is defective on a number of counts. First, by not considering the time value of money, it gives equal weight to all future NCFs over each project's PB period. Consider the case in respect of projects G and I which have equal PBs of four years. The PB selection method is incapable of recognizing that, in early years, the large NCFs on project G, relative to project I, are more valuable than the latter's. Second, once the PB period on a project has been determined, subsequent NCFs which occur beyond this period are ignored in their entirety. This is particularly important in project I's case where the NCFs in the last two years are negative. Third, there are no objective criteria for determining  $PB^{\max}$ . Fourth, there is ambiguity in respect of defining the initial period of net investment outlays. If, for example, net investment outlays on one project occurred only in year zero, but on another project over the first three years of its life, there is no guidance on the point in time at which counting the number of PB periods should begin.

	Project				Discounted NCFs Project G @ 10%
Year	F €s	G €s	H €s	I €s	
Net Investment Outlay					
0	-1000	-1500	-2000	-1500	-1500
1	200	1000	500	100	909
2	400	400	400	400	330
3	100	50	1100	500	38
4	200	50	300	700	34
5	100	150	500	-50	93
6	2000	200	100	-100	113
Standard pay back	5yrs	4yrs	3yrs	4yrs	
NPV @ 10%	€915.17	€17.42	€183.38	-€477.53	5.85yrs

Some attempt has been made to partially accommodate the time value of money in the PB appraisal method, with the suggestion that discounted PB should be used. Here the PB on a project is based on its discounted future NCFs; however, this simply reduces the amount of future NCFs which are ignored, subsequent to the discounted PB period. As an example the NCFs for project G are discounted at 10% and presented in the final column of Table 6.3. The discounted PB for project G is 5.85 years compared to its standard PB of four years.

### Accounting Rate of Return

The ARR is based on a definition of the average annual accounting profits from a project divided by a definition of the annual average investment outlays over a project's life. The ARR is then compared to some hurdle rate arbitrarily set by the company. The ARR, as a non – discounting method, is subject to the same types of criticism as the PB, although the ARR does give consideration to all the accounting profits over the life of a project.

There is a serious additional problem with the ARR, arising from the possibility that the use of accounting numbers may give a misleading view of the NCFs generated by a project. This partly arises because depreciation of the initial capital costs over the future life of a project are treated as explicit cash costs. Further, the accounting definition of profit and the accounting treatment of investment outlays will depend on the accounting convention operated within individual companies and on the accounting standards which happen to be in force at the time when particular project appraisals are being made. These issues are more fully discussed below, when the factors which should be taken into account in formulating a project's NCF profile are specified. Before considering

these factors, however, it is useful to reflect on the general superiority of NPV as an investment appraisal method.

### **The General Superiority of NPV**

The NPV approach to investment appraisal has been shown, in a technical sense, to be superior to the IRR approach and now, in a general sense, to be superior to the other commonly used approaches of PB and the ARR. The merit of the principle of NPV is that it measures the net wealth – creating potential of capital projects, and investments in general, by considering all of a project's NCFs and discounting these at the project's opportunity cost of capital. Maximizing the NPV of project investment maximizes shareholders' wealth. Even in the presence of risk and imperfect capital markets, the most appropriate investment choices are made using investment appraisal techniques which are founded on the NPV principle. Some of these are discussed in the next chapter.

Despite the theoretical superiority of NPV, surveys which have investigated the appraisal techniques used in practice indicate that all four methods appeal to corporate executive. Looking across a wide range of these surveys, there is even the suggestion that, on balance, the PB approach is most favoured. The PB is followed in order of preference, by the ARR, the IRR and finally the NPV. The preference ordering does, however, appear to vary with the size of company, with very large companies undertaking highly sophisticated investment appraisals based on NPV; although even here the other techniques might have a supplementary usage.

One argument in favour of using the IRR is that as a percentage rate of return it is conceptually more familiar than NPV which, as an absolute measure, is some what abstract. The rate of return concept combined with management's familiarity with accounting numbers can explain use of the ARR.

In the case of PB it may be used as a convenient screening device to make an initial selection of projects which would then become subject to detailed formal appraisal using NPV. In addition, since capital projects are medium to long-term, full appraisal involves forecasting all future NCFs. Forecasting, even in the short-term, can be problematic. (Just consider the difficulties in using macro economic models to forecast short – term behaviour in the UK economy).

Consequently, in those situations where management believes that a very low level of confidence can be placed in forecasting revenues and costs which occur in eight, nine or ten years' time, there may be a rationale for using PB (or better still, discounted PB). If a project can

pay back the net investment outlay over the early years of its operation, when NCFs can be measured with a reasonable level of confidence, the project is acceptable. By monitoring the project once it is operational and gaining more information as time passes, on the likely future NCFs beyond the initial PB period, abandonment or continuation decision can be made at a later date.

Fervent supporters of NPV might well view this as heresy. The argument would be that NPV should always be used, if necessary in combination with simulation and sensitivity analysis. Here, probabilities are assigned to future outcomes and changes in a project's NPV analyzed as assumptions about the future are varied. Such an argument is correct, provided decision makers are operating in an environment of risk where, as Knight (1921) argues, probabilities can be measured objectively or subjectively. Using Knight's distinction between risk and uncertainty, this is not possible in the latter situation since, by definition, uncertainty exists where numerical probabilities (either objective or subjective) cannot be assigned to future outcomes.

### **3.5 Project Analysis and Other Techniques of Optimizing Behaviour**

It is obvious from the foregoing discussion that project analysis involves two techniques of optimizing behaviour: (i) the classical theory of the firm in the case of private sector projects, and (ii) economic and social benefit-cost analysis for public sector projects. In the classical theory of the firm, the business firm is represented as maximizing profits; that is, the difference between the discounted stream of revenue and the discounted stream of costs, both revenue and costs being measured in financial terms. The revenue includes only the value of those benefits which the firm can market and costs include only those that the firm bears.

The benefit-cost analysis of a public investment resembles the analysis of profit maximizing firm. The difference between the two lies in the identification and measurement of benefits and costs, the problem of incorporating the multiple objectives of the public sector in the analysis, the determination of social discount rate and shadow or accounting prices where market prices do not reflect the true value of the good or service to the economy.

Both the financial and the benefit-cost analyses are optimizing techniques because (i) they consider alternative projects that will satisfy the same objectives before choosing the best, and (ii) for the chosen project, they consider alternative sizes and locations before choosing the best that satisfy the stipulated objectives. Thus, there is no known

alternative that can yield a better result. The long-run average cost curve and equilibrium analysis of the firm exemplifies this optimizing technique.

Project analysis may be contrasted with two other techniques of maximizing behaviour; cost-effectiveness analysis, and classical operations analysis. Cost-effectiveness analysis is specifically directed to problems in which the output cannot be evaluated in market prices, but where the inputs are substitutable at exchange relationships developed in the market. It addresses itself to maximizing effectiveness subject to a generalized resource constraint measured in financial terms (Odufalu, 2000).

Cost-effectiveness analysis is appropriate in situations where there is no market evaluation of alternative outputs; as in defence sector , and where the resource inputs can be appropriately evaluated at market prices.

Classical operations analysis is addressed to problems of maximizing effectiveness, subject to a set of specific resource constraints which are measured in the amount of the several types of resources available. The analysis can be conducted entirely in physical and other non-monetary terms. Such analysis is appropriate where there is no market evaluation of either input or output, for example, as in the scheduling of production with a given set of production resources.

#### **4.0 CONCLUSION**

In the course of our study in this unit we were able to discuss the objectives of techniques or tools for analyzing proposed project, enumerate the use of various techniques such as discounted cash flow methods and non discounted cash flow methods. Thus, Net Present Value method was found to be most useful because it considered time value of money. However, it is very important for analysts to make use of the foregoing method for effective and efficient analysis of any proposed project.

#### **5.0 SUMMARY**

In summary, this unit discussed project's tools and techniques of analysis among which are pay back period, accounting rate of return, profitability index, net present value, and internal rate of returns.

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the superiority of NPV over all other tools of project analysis?
2. What is project technique? Differentiate between discounted cash flow and non discounted cash flow techniques?

## 7.0 REFERENCES/FURTHER READINGS

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## UNIT 4      **BREAK-EVEN ANALYSIS**

### CONTENTS

- 1.0    Introduction
- 2.0    Objectives
- 3.0    Main Content
  - 3.1    The Break-Even Chart
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### 1.0    **INTRODUCTION**

Break-even analysis is a technique widely used by production management and management accountants. It is based on categorizing production costs between those which are "variable" (costs that change when the production output changes) and those that are "fixed" (costs not directly related to the volume of production).

Total variable and fixed costs are compared with sales revenue in order to determine the **level of sales volume, sales value or production at which the business makes neither a profit nor a loss (the "break-even point")**.

### 2.0    **OBJECTIVES**

At the end of this unit student will be able to:

- discuss what break-even point defines when an investment will generate a positive return.
- discuss the fact that fixed costs are not directly related to the level of production.
- Illustrate the fact that variable costs change in direct relation to volume of output.
- Explain the fact that total fixed costs do not change as the level of production increases.

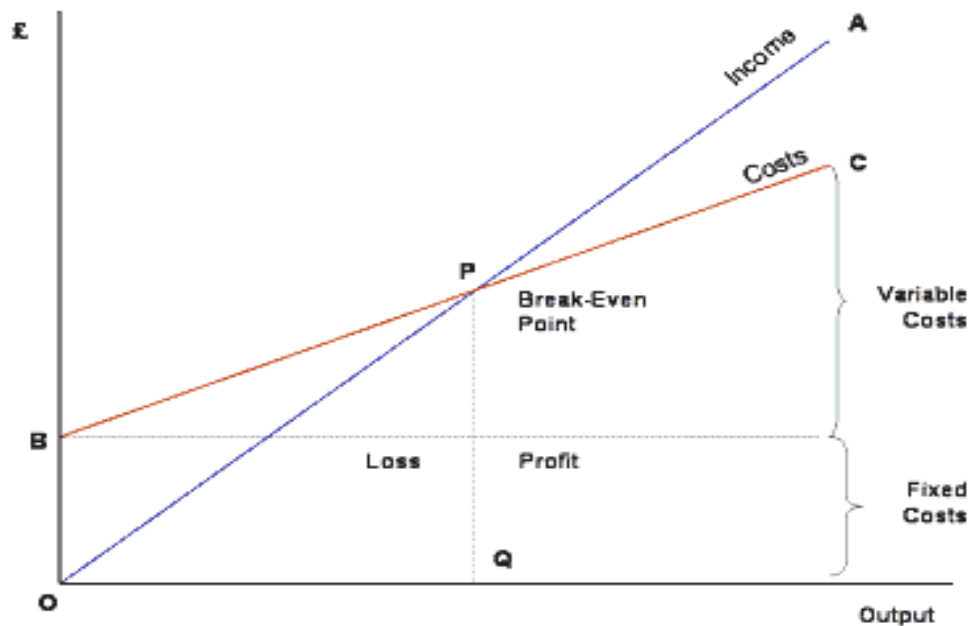
### 3.0    **MAIN CONTENT**

#### 3.1    **The Break-Even Chart**

In its simplest form, the break-even chart is a graphical representation of costs at various levels of activity shown on the same chart as the variation of income (or sales, revenue) with the same variation in



activity. The point at which neither profit nor loss is made is known as the "break-even point" and is represented on the chart below by the intersection of the two lines:



In the diagram above, the line OA represents the variation of income at varying levels of production activity ("output"). OB represents the total fixed costs in the business. As output increases, variable costs are incurred, meaning that total costs (fixed + variable) also increase. At low levels of output, Costs are greater than Income. At the point of intersection, P, costs are exactly equal to income, and hence neither profit nor loss is made.

### Fixed Costs

Fixed costs are those business costs that are not directly related to the level of production or output. In other words, even if the business has a zero output or high output, the level of fixed costs will remain broadly the same. In the long term, fixed costs can alter - perhaps as a result of investment in production capacity (e.g. adding a new factory unit) or through the growth in overheads required to support a larger, more complex business.

### Examples of Fixed Costs

- Rent and rate
- Depreciation
- Research and development
- Marketing costs (non- revenue related)
- Administration costs

### Variable Costs

Variable costs are those costs which vary directly with the level of output. They represent payment output-related inputs such as raw materials, direct labour, fuel and revenue-related costs such as commission.

A distinction is often made between "**Direct**" variable costs and "**Indirect**" variable costs.

**Direct** variable costs are those which can be directly attributable to the production of a particular product or service and allocated to a particular cost centre. Raw materials and the wages those working on the production line are good examples.

**Indirect** variable costs cannot be directly attributable to production but they do vary with output. These include depreciation (where it is calculated related to output - e.g. machine hours), maintenance and certain labour costs.

### **Semi-Variable Costs**

Whilst the distinction between fixed and variable costs is a convenient way of categorizing business costs, in reality there are some costs which are fixed in nature but which increase when output reaches certain levels. These are largely related to the overall "scale" and/or complexity of the business. For example, when a business has relatively low levels of output or sales, it may not require costs associated with functions such as human resource management or a fully-resourced finance department. However, as the scale of the business grows (e.g. output, number people employed, number and complexity of transactions) then more resources are required. If production rises suddenly then some short-term increase in warehousing and/or transport may be required. In these circumstances, we say that part of the cost is variable and part fixed.

## **3.2 Break-Even Method of Investment Analysis**

Break-even analysis is a useful tool to study the relationship between fixed costs, variable costs and returns. A break-even point defines when an investment will generate a positive return and can be determined graphically or with simple mathematics. Break-even analysis computes the volume of production at a given price necessary to cover all costs. Break-even price analysis computes the price necessary at a given level of production to cover all costs. To explain how break-even analysis works, it is necessary to define the cost items.

**Fixed Costs**, incurred after the decision to enter into a business activity is made, are not directly related to the level of production. Fixed costs include, but are not limited to, depreciation on equipment, interest costs, taxes and general overhead expenses. Total fixed costs are the sum of the fixed costs.

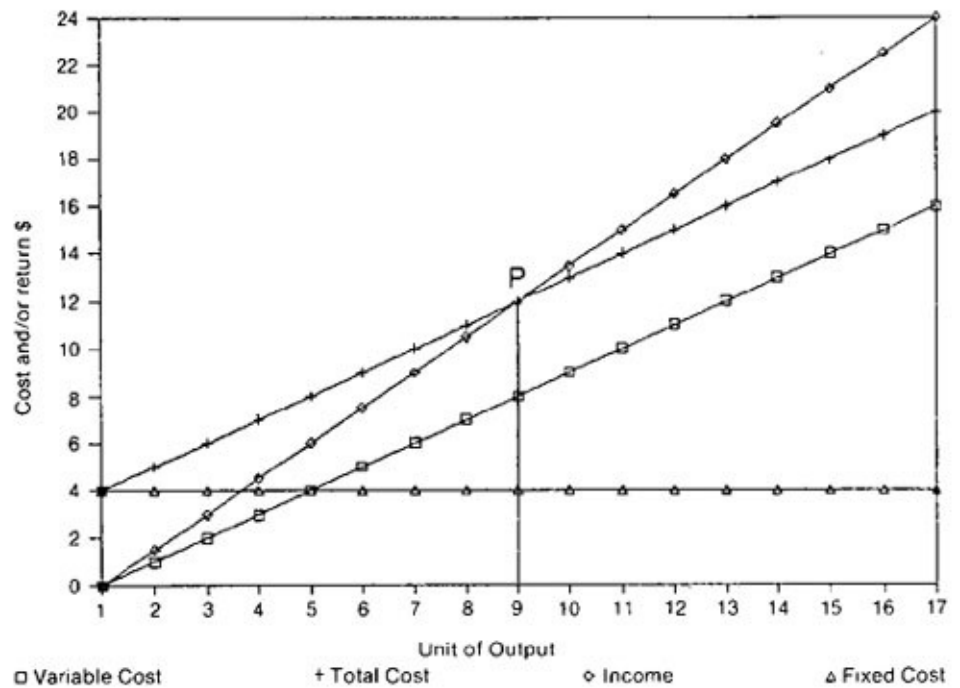
**Variable Costs** change in direct relation to volume of output. They may include cost of goods sold or production expenses such as labor and power costs, feed, fuel, veterinary, irrigation and other expenses directly related to the production of a commodity or investment in a capital asset. Total variable costs (TVC) are the sum of the variable costs for the specified level of production or output. Average variable costs are the variable costs per unit of output or of TVC divided by units of output.

Total fixed costs are shown in Figure 1 by the broken horizontal line. Total fixed costs do not change as the level of production increases. Total variable costs of production are indicated by the broken line sloping upward, which illustrates that total variable costs increase directly as production increases.

The total cost line is the sum of the total fixed costs and total variable costs. The total cost line parallels the total variable cost line, but it begins at the level of the total fixed cost line.

The total income line is the gross value of the output. This is shown as a dotted line, starting at the lower left of the graph and slanting upward. At any point, the total income line is equivalent to the number of units produced multiplied by the price per unit.

The key point (break-even point) is the intersection of the total cost line and the total income line (Point P). A vertical line down from this point shows the level of production necessary to cover all costs. Production greater than this level generates positive revenue; losses are incurred at lower levels of production.



**Figure 1: Graph form of break-even analysis.**

### Mathematical Explanation

The graphic method of analysis helps the reader understand the concept of the **break-even point**. However, graphing the cost and income lines is laborious. The break-even point is found faster and more accurately with the following formula:

$$B-E = F / (S - V)$$

where:

B-E = break-even point (units of production),

F = total fixed costs,

V = variable costs per unit of production,

S = savings or additional returns per unit of production, and

The mathematical approach is best presented using examples.

### Example 1

A farmer wants to buy a new combine rather than hire a custom harvester. The total fixed costs for the desired combine are \$21,270 per year. The variable costs (not counting the operator's labor) are \$8.75 per hour. The farmer can harvest 5 acres per hour. The custom harvester charges \$16.00 per acre. How many acres must be harvested per year to break-even?

Fixed costs (F) = \$21,270

Savings (S) = \$16/A

Variable costs (V) = \$8.75/hr / 5 A/hr = \$1.75/A

B-E = \$21,270 / (\$16/A - \$1.75/A) = \$21,270 / \$14.25/A = 1,493 Acres

### Example 2

Break-even analysis can be easily extended to consider other changes. If the farm operator can save two additional bushels of wheat per acre more than the custom harvester, what would be the break-even point if wheat is worth \$4/bushel?

Additional income = \$4/bu \* 2 bu/A = \$8/A

B-E = \$21,270 / (\$16/A + \$8/A - \$1.75/A)

= \$21,270 / \$22.25/A = 956 Acres

### Example 3

A farmer raising 1,200 acres of wheat per year considers purchasing a combine. How much additional return (to land, capital labor, management and risk) would result?

Additional return = (savings or additional income) - (fixed costs + variable costs)

Additional profit = [ \$16/ac + (\$4/bu \* 2 bu/ac) ] x 1200 A = \$21,270 + [ (\$8.75/hr / 5 A/hr) x 1200 A ] = \$28,800 - \$23,370 = \$5,430

Thus, the farmer would generate another \$5,430 in additional return by purchasing the combine. A farmer harvesting only 900 acres would probably choose not to buy the combine because the acreage is below the break-even point of 956 acres. The farmer may want to evaluate the purchase of a smaller or used combine.

### Additional Situations

Two additional situations are presented as follows:

**Problem 1.** If the fixed costs for the combine are \$12,000 per year, no additional yield is expected, variable costs are \$7 per hour and the farmer can combine 4 acres per hour, what is the new break-even point?

**Problem 2.** If 900 acres are harvested, what is the effect on the farmer's profits?

**Solutions**

Fixed costs = \$12,000

Savings = \$16/A

Variable costs = \$7/hr / 4 A/hr = \$1.75/A

Problem 1:

B-E =  $\$12,000 / (\$16/A - \$1.75/A) = \$12,000 / \$14.25/A = 842 \text{ Acres}$

**Problem 2:**

Additional profit =  $(\$16/A \times 900 \text{ A}) - [\$12,000 + (\$7/\text{hr} / 4 \text{ A/hr} \times 900 \text{ A})]$   
 $A = \$14,000 - \$13,575 = \$825 \text{ increase}$

**3.3 Appraisal of Break-even Analysis**

The main advantage of break-even analysis is that it points out the relationship between cost, production volume and returns. It can be extended to show how changes in fixed cost-variable cost relationships, in commodity prices, or in revenues, will affect profit levels and break-even points. Limitations of break-even analysis include:

- It is best suited to the analysis of one product at a time;
- It may be difficult to classify a cost as all variable or all fixed; and
- There may be a tendency to continue to use a break-even analysis after the cost and income functions have changed.

Break-even analysis is most useful when used with partial budgeting or capital budgeting techniques. The major benefit to using break-even analysis is that it indicates the lowest amount of business activity necessary to prevent losses.

**Break-Even Analysis**

This type of report is neither one that is automatically generated by most accounting software, nor is it one that is normally produced by your accountant, but it is an important analysis for you to have and understand. For any new business, you should predict what gross sales volume level you will have to achieve before you reach the break-even point and then, of course, build to make a profit. For early-stage businesses, you should be able to assess your early prediction and determine how accurate they were, and monitor whether you are actually on track to make the profits you need. Even the mature business would be wise to look at their current break-even point and perhaps find ways to lower that benchmark to increase profits. The recent massive layoffs at large corporations are directed at this goal, lowering the break-even point and increasing profits.

**Break-even is the volume where all fixed expenses are covered.**

You will start a break-even analysis by establishing all the fixed (overhead) expenses of your business. Since most of these are done on a monthly basis, don't forget to include the estimated monthly amount of line items that are normally paid on a quarterly or annual basis such as payroll, taxes or insurance. For example, if your annual insurance charge is \$9,000, use 1/12 of that, or \$750 as part of your monthly budget. With the semi-variable expense (such as phone charges, travel, and marketing), use that portion that you expect to spend each and every month.

For the purpose of a model break-even, let's assume that the fixed expenses look as follows:

Administrative salaries	\$1,500
Rent	800
Utilities	300
Insurance	150
Taxes	210
Telephone	240
Auto expense	400
Supplies	100
Sales and marketing	300
Interest	100
Miscellaneous	400
Total	\$4,500

These are the expenses that must be covered by your gross profit. Assuming that the gross profit margin is 30 per cent, what volume must you have to cover this expense? The answer in this case is 15,000—30 per cent of that amount is \$4,500, which is your target number.

The two critical numbers in these calculations are the total of the fixed expense and the percentage of gross profit margin. If your fixed expense is \$10,000 and your gross profit margin is 25 percent, your break-even volume must be \$40,000.

**This is Not a Static Number**

You may do a break-even analysis before you even begin your business and determine that your gross margin will come in at a certain percentage and your fixed expense budget will be set at a certain level. You will then be able to establish that your business will break-even (and then go on to a profit) at a certain level of sales volume. But your

prestart projections and your operating realities may be very different. After three to six months in business, you should compare projections to the real-world results and reassess, if necessary, what volume is required to reach break-even levels.

Along the way, expenses tend to creep up in both the direct and indirect categories, and you may fall below the break-even volume because you think it is lower than it has become. Take your profit and loss statement every six months or so and refigure your break-even target number.

### Ways to Lower Break-Even

There are three ways to lower your break-even volume, only two of them involve cost controls (which should always be your goal on an ongoing basis).

1. Lower direct costs, which will raise the gross margin. Be more diligent about purchasing material, controlling inventory, or increasing the productivity of your labor by more cost effective scheduling or adding more efficient technology.
2. Exercise cost controls on your fixed expense, and lower the necessary total dollars. Be careful when cutting expenses that you do so with an overall plan in mind. You can cut too deeply as well as too little and cause distress among workers, or you may pull back marketing efforts at the wrong time, which will give out the wrong signal.
3. Raise prices! Most entrepreneurs are reluctant to raise prices because they think that overall business will fall off. More often than not that doesn't happen unless you are in a very price-sensitive market, and if you are, you really have already become volume driven.

But if you are in the typical niche-type small business, you can raise your prices 4 to 5 per cent without much notice of your customers. The effect is startling. For example, the first model we looked at was the following:

Volume	\$15,000	
direct cost	10,500	70%
gross profit	4,500	

Raising the prices 5 per cent would result in this change:

Volume	\$15,750	
direct cost	10,500	67%



gross profit      5,250

You will have increased your margin by 3 per cent, so you can lower the total volume you will require to break-even.

#### **4.0 CONCLUSION**

You are in business to make a profit not just break-even, but by knowing where that number is, you can accomplish a good bit:

You can allocate the sales and marketing effort to get you to the point you need to be. Most companies have slow months, so if you project volume below break-even, you can watch expenses to minimize losses. A few really bad months can wipe out a good bit of previous profit. Knowing the elements of break-even allows you to manage the costs to maximize the bottom line. Once you have gotten this far in the knowledge of the elements of your business, you are well on your way to success.

#### **5.0 SUMMARY**

In the course of this study various definitions of break-even were identified, while the elements of break even were examined and finally, the analysis of break-even vis-à-vis project financing.

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. What do you understand by break-even analysis? Illustrate break-even point on a graph?
2. Discuss the merits and demerits of break-even analysis in project financing?

#### **7.0 REFERENCES/FURTHER READINGS**

- Black Homer A., John E. champion and R. Gene Brown. *Accounting in Business Decisions: Theory, Method and Use* (Englewood Clif, N J. Prentice Hall Incorporated 1967).
- Lawson G. H. and D. W Windle. *Capital Budgeting and Use of DCF Criteria in the Corporation Tax Regime* (London, Oliver and Boyd. 1967).
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## **UNIT 5      BUDGETING TECHNIQUES**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Purposes of Cash Budgeting
  - 3.2 Consistent Budgets
  - 3.3 Computation of Cash Budgeting
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

### **1.0 INTRODUCTION**

Planning for and controlling the use of cash are important tasks. Failure to properly anticipate cash flow can lead to idle cash balances and lower rate of return on one hand and to cash deficit on the other hand.

Cash budget is a device that all financial managers plan for and control the use of cash. It is a work sheet that shows cash inflows, outflows and cash balances over some budgeted time period. Its importance include:

1. it helps to determine operating cash requirements
2. it helps to anticipate short-term finances
3. it helps to manage money market investment.

The time frame work of a cash budget is usually short-maximum one year. Within this time frame work the firm will forecast cash inflows, outflows and cash balances typically on a monthly or weekly basis.

### **2.0 OBJECTIVES**

At the end of this unit students will be able to:

- state the purposes of cash budgeting
- discuss the various types of cash budgeting
- compute a cash budget.

### **3.0 MAIN CONTENTS**

#### **3.1 Purposes of Cash Budgeting**

Properly preparing your cash budget will show how cash flows in and out of your business. Also, it may then be used in planning your short-term credit needs. In today's financial world, you are required by most financial institutions to prepare cash budgets before making capital expenditures for new assets as well as for expenditures associated with any planned expansion. The cash budget determines your future ability to pay debts as well as expenses. For example, preliminary budget estimates may reveal that your disbursements are lumped together and that, with more careful planning, you can spread your payments to creditors more evenly throughout the entire year. As a result, less bank credit will be needed and interest costs will be lower. Banks and other credit-granting institutions are more inclined to grant you loans under favorable terms if your loan request is supported by a methodical cash plan. Similarly, businesses that operate on a casual day-to-day basis are more likely to borrow funds at inopportune times and in excessive amounts. Without planning, there is no certainty that you will be able to repay your loans on schedule. However, once you've carefully mapped out a cash budget, you will be able to compare it to the actual cash inflows and outflows of your business. You will find that this comparison will go a long way in assisting you during future cash budget preparation. Also, a monthly cash budget helps pinpoint estimated cash balances at the end of each month, which may foresee short-term cash shortfalls.

#### **3.2 Consistent Budgets**

Cash budgeting is a continuous process that can be checked for consistency and accuracy by comparing budgeted amounts with amounts that can be expected from using typical ratios or financial statement relationships. For example, your treasurer will estimate the payments made to your suppliers of merchandise or materials, the payments to employees for wages and salaries, and the other payments that you are obligated to make. These payments can be scheduled by dates so that all discounts will be taken, and so that no obligation will be overlooked when it comes due. Cash collections from customers can also be estimated and scheduled by dates along with other expected cash receipts. With careful cash planning, you should be able to maintain a sufficient cash balance for your needs and not put yourself in the position of holding excessive balances of non-productive cash. In the normal course of operations in a merchandising business, for example, merchandise is purchased and sold to customers who eventually pay for the merchandise sold to them. Usually there is a time lag in business

operations. It may be necessary to pay the suppliers for merchandise before the merchandise is sold to the customers. Before and during a busy selling season the demand for cash may be higher than the inflow of cash from operations. In this case it may be necessary to arrange short-term loans. When the selling season is over, cash collections from customers will be relatively large and the loans can be paid off.

### 3.3 Computation of Cash Budgeting

#### FORMAT OF CASH BUDGET:

##### A. ESTIMATED CASH INFLOW:

	Jan.	Feb.	March	April	May	June
Cash Sales	XX	XX	XX	XX	XX	XX
Receivable Collection	XX	XX	XX	XX	XX	XX
Sales of Marketable Securities	XX	XX	XX	XX	XX	XX
Other Cash Receipts	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>
Total cash inflow (A)	—	—	—	—	—	—

##### B. ESTIMATED CASH OUTFLOW:

Cash Purchase	XX	XX	XX	XX	XX	XX
Payment of loan	XX	XX	XX	XX	XX	XX
Interest on loan	XX	XX	XX	XX	XX	XX
Taxation and dividend paid	XX	XX	XX	XX	XX	XX
Payable payment	XX	XX	XX	XX	XX	XX
Other payments	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>
Total cash Outflow (B)	—	—	—	—	—	—

##### C. NET CASH FLOW

(A-B)	XX	XX	XX	XX	XX	XX
Opening cash balances	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>
Closing Cash Balances	XX	XX	XX	XX	XX	XX
Less: Min. Closing Balance	<u>(XX)</u>	<u>(XX)</u>	<u>(XX)</u>	<u>(XX)</u>	<u>(XX)</u>	<u>(XX)</u>
Cash Surplus / Deficit	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>

**Example 1**

The expected sales and purchases figure of Great Atlantic Ltd. from November 1995 to June 1996 are as follows:

Month	Sales N	Purchases N
Nov. '95	3,000	2,000
Dec. '95	3,500	1,000
Jan. '96	2,500	800
Feb. '96	2,000	1,000
Mar. '96	2,500	1,200
April '96	3,000	1,400
May '96	3,500	1,500
June '96	3,800	1,500

The company has established a sale policy of 20% cash and 80% credit, 40% and 60% of credit sales are collectable in the first and second month after sales respectively. The company suppliers granted credit purchases of 1 month. All company's purchases were on credit. The company has budgeted for a capital expenditure of N1500 and N300 for the month of March 1996 and April '96 respectively. Dividend of N1200 is to be paid in three installments starting from April '96. an outstanding tax liability of N250 is planned to be paid in May '96. The company has a begin cash balance of N100 and intend to maintain a minimum cash balance of N1500 in each month. Salary for each month will amount to N500.

Required:

Determine the cash position of the company from Jan. '96. Also indicate how much the company has to withdraw from his saving account every month or how much the company must be saved every month?

**Solution****A. ESTIMATED CASH INFLOW:**

	Jan. N	Feb. N	March N	April N	May N	June N
Cash Sales (Note 1)	500	400	500	600	700	760
Receivables (Note 2)	<u>2560</u>	<u>2480</u>	<u>1840</u>	<u>1760</u>	<u>2160</u>	<u>2560</u>
Total cash inflow	(A) <u>3060</u>	<u>2880</u>	<u>2340</u>	<u>2360</u>	<u>2860</u>	<u>3320</u>

**B. ESTIMATED CASH OUTFLOW:**

Creditors	1000	800	1000	1200	1400	1500
Capital Expenditure	-	-	150	300	-	-
Dividend paid		-	-	-	400	400
400						
Tax liability	-	-	-	-	250	-
Salary	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>
Total cash Outflow (B)	<u>1500</u>	<u>1300</u>	<u>3000</u>	<u>2400</u>	<u>2500</u>	<u>2400</u>
<b>C. NET CASH FLOW</b>						
(A-B)	1560	1580	(660)	(40)	310	920
Opening cash balances	<u>100</u>	<u>1660</u>	<u>3240</u>	<u>2580</u>	<u>2540</u>	<u>2850</u>
Closing Cash Balances	1660	3240	2580	2540	2850	3770
Less: Min. Closing Balance	(1500)	(1500)	(1500)	(1500)	(1500)	(1500)
Cash Surplus / Deficit		<u>160</u>	<u>740</u>	<u>1080</u>	<u>1040</u>	<u>1350</u>

**WORKINGS:**

Note 1- Expected sale

Month	Total Sale	cash sale (20%)	credit sale (80%)
	sales' payment		
	40% = a month after		
	60% = 2 months after		
Nov 95	3000	600	2400 -
Dec.	3500	700	2800 960
Jan '96	2500	500	2000 1440 + 1120 = 2560
Feb.	2000	400	1600 1680 + 800 = 2480
March	2500	500	2000 1200 + 640 = 1840
April	3000	600	2400 960 + 800 = 1760
May	3500	700	2800 1200 + 960 = 2160
June	3800	760	3040 1440 + 1120 = 2560
July	-	-	- 1680 + 1216 = 2560
August	-	-	- 1824

Note 2 - Expected Purchase

Month	Total Purchase	Cash Purchase
	credit purchase payment	
Nov 95	2000	-
Dec.	1000	-
Jan '96	800	-
Feb.	1000	-
March	1200	-
April	1400	-
May	1500	-
June	1500	-
July	-	-

## 4.0 CONCLUSION

In the course of our study in this unit we were able to discuss the purpose of cash budgeting, various types and forms of cash budgets, format of cash budget and computation of cash budget. Thus, cash budget is a financial plan that considers both future income and expenditures and should be given adequate attention.

## 5.0 SUMMARY

In summary, this unit discussed the purposes of cash budget and also gave the format for computing a cash budget as well as some illustrations of cash budgeting.

## 6.0 TUTOR-MARKED ASSIGNMENT

1. What is cash budgeting? State and discuss purposes of cash budgeting?
2. The expected sales and purchases figure of Great Atlantic Ltd. from November 2007 to June 2008 are as follows:

Month	Sales N	Purchases N
Nov. '07	3,000	2,000
Dec. '07	3,500	1,000
Jan. '08	2,500	800
Feb. '08	2,000	1,000
Mar. '08	2,500	1,200
April '08	3,000	1,400
May '08	3,500	1,500
June '08	3,800	1,500

The company has established a sale policy of 40% cash and 60% credit, 30% and 70% of credit sales are collectable in the first and second months after sales respectively. The company suppliers granted credit purchases of 1 month. All company's purchases were on credit. The company has budgeted for a capital expenditure of N1600 and N400 for the month of March 1996 and April '96 respectively. Dividend of N1200 is to be paid in three installments starting from April '08. An outstanding tax liability of N300 is planned to be paid in May '08. The company has a begining cash balance of N200 and intends to maintain a minimum cash balance of N2000 in each month. Salary for each month will amount to N500.



**Required:**

Determine the cash position of the company from Jan. '08. Also indicate how much the company has to withdraw from its savings account every month or how much the company must have saved every month?

**7.0 REFERENCES/FURTHER READINGS**

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