
UNIT 7 FINANCIAL MANAGEMENT MEASURES

Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Budgeting
- 7.3 Balance Sheet and Income Statement
- 7.4 Cash Flow Statement
- 7.5 Break-Even Analysis
- 7.6 Net Present Value
- 7.7 Cost Benefit Analysis
- 7.8 Internal Rate of Return
- 7.9 Let Us Sum Up
- 7.10 Glossary
- 7.11 Suggested Further Reading
- 7.12 References
- 7.13 Answers to Check Your Progress

7.0 OBJECTIVES

After reading this unit, you will be able to:

- explain budgeting;
- discuss on different financial statements and some financial ratios that can be derived from the balance sheet and income statement that are indicators about the financial health of the firm;
- define break-even analysis; and
- describe the concepts like the net present value, cost-benefit analysis and internal rate of return.

7.1 INTRODUCTION

In the last unit, you had looked into the factors of production, the concept of total product and marginal product, the law of diminishing returns and the cost concepts. You also have understood that the firm uses the factors of production judiciously or optimally to make production most efficient. You also know that the factors come at a cost and most firms try to produce the maximum at minimum cost. All production processes incur cost. Costs are involved in the production of dried fish as much as it is involved in the production of cars. The magnitude of the costs

involved will vary according to the level and type of production. The end result of production processes are the output and financial returns. We know from common sense that when returns are more than the costs, firms earn profits. But for this to happen, firms have to take very informed and conscious decisions about how, when and how much to produce. For instance dried fish cannot be produced during the monsoon season (the ‘**when**’ to produce is important here). But there will be demand for dry fish even during that period. Production can take place when there is abundant sunshine. Dried fish can be packed and stored to meet future demand. The question then arises as to **how much** to produce. ‘How much to produce’ depends on various factors as we have seen in the previous unit. It depends on the availability of raw material, labour, demand by the consumer etc. Ultimately, the aim of any firm is to run the firm profitably, incurring minimum costs. There are various measures to see if the business is running profitably, if the project envisaged is going to yield the return we anticipate, at what level a firm should be producing etc?. We will learn about some of the tools of financial management in this unit. These tools will be necessary in analyzing any project or business for profitability which is the ultimate aim of any firm. You need to know all these tools when you are planning to start a fish product unit.

7.2 BUDGETING

Everybody has heard of a budget. A family has its own budget. The income of the family is allocated among various requirements, there will be school fees to be paid, groceries to be purchased, there may be a festival round the corner with a set of expenditure for it, and there will be unforeseen expenses in the form of medical care or social obligations. All these are reflected in a budget.

The Finance Minister presents the budget for the country every year. So you see whether it is a small family or a big country, budgeting is a pre-requisite to good financial management. *A budget is actually a forecast of the income that is likely to accrue and the expenses that are likely to occur during a particular period, usually a period of one year.* Budgeting is nothing but planning out the budget. It is a plan made as to how the resources can be allocated among various activities to achieve our goals. If the firm wants to increase its profitability, it will have to decide on ‘how’, ‘when’, ‘how much’ and “at what cost” to produce.



Activity 1

Check out the budget presented by the Finance Minister this year. Details will be available in newspapers. List out the salient points in the budget. Where have taxes been increased? (that is an income for the Government), where has the expenditure been sanctioned? - health care, education, agriculture etc. Can you categorize the various points listed into the heads-income and expenditure?

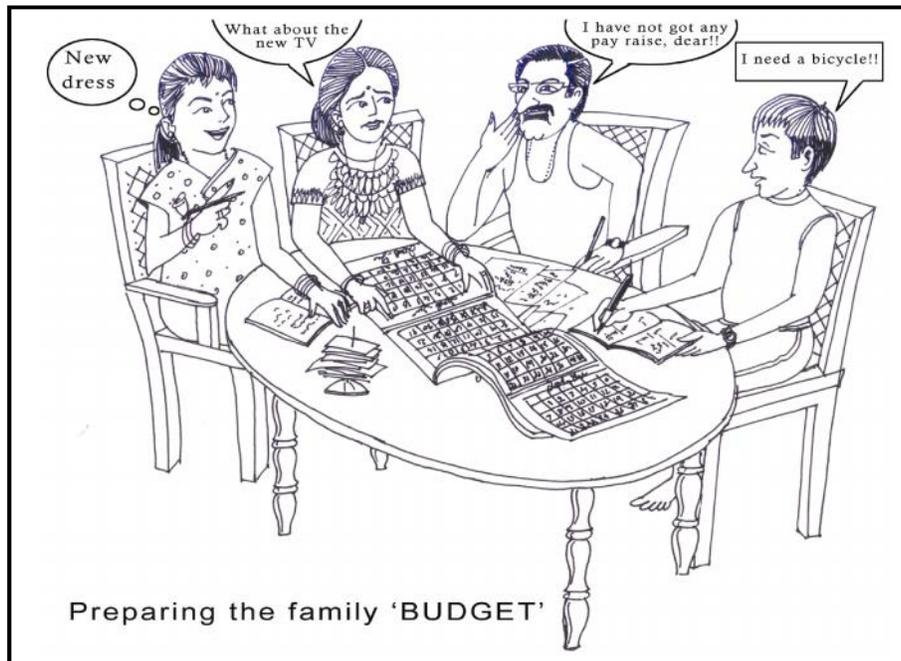
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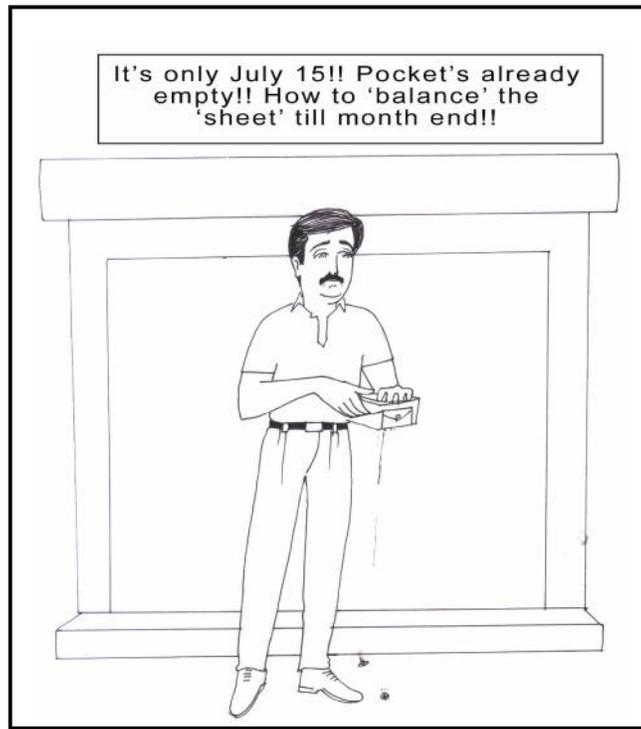
There is another term widely used and that is ‘capital budgeting’ when long term projects are mentioned. Capital budgeting is a long term budgeting and is usually covering several years. It is undertaken to determine whether a project envisaged will be feasible and our capital investment worth it? There are also ‘partial budgets’ which can be done when some specific alternative method of production and a separate flow of expenditure and income are expected. This is widely used in agriculture businesses where there are possibilities of a mixture of enterprises, like different crops, dairy, poultry etc. all of which can be taken up together and a change can be introduced in any one of the enterprises. It may be the adoption of some improved technology or modification of the existing technology or a change in the input mix etc. The same can also be used for industries provided changes can be selectively made.



Budgets ultimately help us in taking economic decisions and also will let us know how much our enterprise or firm will need to be operational. Lending institutions or institutions that give loans will also be able to use the budget to decide whether the firm can repay the loan looking at the expected returns.

7.3 BALANCE SHEET AND INCOME STATEMENT

Now that we have made a budget and begun our operations, the next step would be to check if everything is going according to plan. While doing a business or running a project it makes sense to keep records. At the beginning of every month, we make a plan on how to spend the income of the family. At the end of each day, we write down how much we have spent. At the end of the month we have a statement of how much we have earned and how much we have spent. This is our income-expenditure statement. If we somehow manage to record all our assets and liabilities during the year and balance out at the end of the year, it is our balance sheet. Just like the family, firms also have their income statements and balance sheets. *A balance sheet is a statement showing the total assets, total liabilities and net worth of a firm.* The difference between the total assets and total liabilities is called the net worth. It is an indicator of the solvency of the firm or to show whether the firm can meet its financial obligations like debts and other payments to be made.



The balance sheets are also with reference to some time period and are usually prepared by firms annually. The left side of the balance sheet shows the assets and the right side the liabilities. The balance sheet has to have the assets and liabilities sections 'balanced' and hence the name balance sheet.



Activity 2

Balance sheets of companies are published in newspapers. Check out newspapers and see if you can find one. Can you see how the assets and liabilities are given in the balance sheet?

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Assets are everything that is 'owned' by the firm. Liabilities are everything that is 'owed' by the firm. Both assets and liabilities can be current or long term. Current means the short term and it refers to those assets and liabilities that can be converted to cash or have to be repaid, respectively, at short notice. Long term as the term indicates refers to the long term assets; it is those assets that can be used for several years and for liabilities it refers to those liabilities that need be met over several years. Current assets would include cash at hand or your inventory (raw material or finished goods or stocks), bank savings, loans you have given etc. which can be converted to cash at short notice. Long term assets or fixed assets include land and buildings, machinery that is used in production and will need no change for several years etc.

Current liabilities would include payments to be made to raw material suppliers, maintenance of machinery, wages or short term loans and long term liabilities would include long term loans, owner's equity or share capital etc.



Balance sheets have to be published by companies and are a requirement that has to be met by all companies according to the Companies Act, 1956. A simple hypothetical example of a balance sheet is given in Table 7.1

Table 7.1: Balance Sheet

Assets (Rs.)		Liabilities (Rs.)	
<i>Current Assets</i>		<i>Current Liabilities</i>	
Cash in hand	6,000	Accounts payable	15,000
Savings in bank	2,500	Loan repayment	15,000
Receivables	6,500	Operational costs	8,000
Raw material stock	30,000		
Total current assets	45,000	Total Current liabilities	38,000
<i>Fixed Assets</i>		<i>Long term liabilities</i>	
Land	16,000	Long term repayment	30,000
Building	50,000		
Equipment	20,000		
Depreciation	7,000		
Other assets	2,800	Total shareholder equity	72,800
Total fixed assets	95,800	Total long term liabilities	1,02,800
Total assets	1,40,800	Total Liabilities	1,40,800

The income statement is a statement of the income and expenditure of a firm. The income statement shows all the receipts of a firm and all the expenditure it incurs. Receipts include sales of goods, sale of assets, interests received, appreciation of assets etc. Expenses include operational expenses as well as fixed expenses. You may recollect the various costs that we have learnt in Unit 2. All those costs will form part of the expenses. It will include cost of raw material, labour wages, interest on working capital, maintenance of machinery etc. which are operating expenses and depreciation, salaries of permanent staff, rent on land and building etc. which are fixed expenses. The profits gained are the income minus the expenditure. An income statement would look like the one given in Table 7.2:

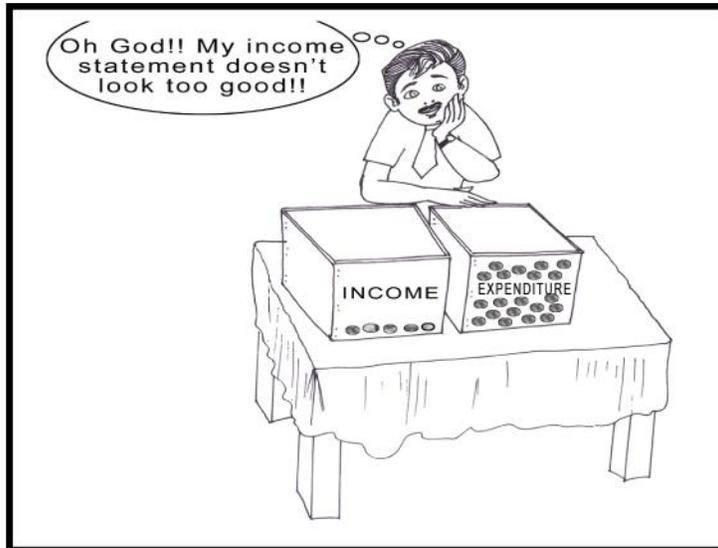
Table 7.2: Income Statement

Particulars	Amount (Rs.)
Revenue	
Gross sales	1,22,500
Sale of assets	2,500
Accrued interest	2,500
Total Income	1,27,500
Expenses	
<i>Operating expenses</i>	
Raw material	35,000
Contract labour	10,000
Transportation	5,000
Advertising	2,500
Maintenance	1,500
Total Operating Expenses	54,000
<i>Fixed expenses</i>	
Rent	6000
Depreciation	1,000
Interest payments	8,000
Salaries of permanent staff	10,000
Total Fixed Expenses	25,000
Profit/Loss (Net Cash Income)	+48,500

The profit/loss of the firm can thus be easily understood by looking at the income statement. Further the net operating income can also be derived from it by deducting the total operating expenses from the total income. In the above example, it is Rs. 1,27,500 - Rs. 54,000, which is equal to Rs. 73,500. The profit is also shown after tax, after deducting the tax from the profit amount. This is then the profit after tax.

We have seen the balance sheet and the income statement and both of them are financial statements that give an idea whether the firm is operating profitably or not. What else can be deduced from these statements? Various financial ratios can be calculated which give an indication of the health of the firm. These ratios can be used to find out the liquidity of the firm, i.e., the ability of the firm to meet current or short-term liabilities, operational ratios to show how efficiently the firm is operating etc. Let us see some of these ratios.

The first one is the *current ratio* which is the total current assets divided by the total current liabilities. Only if the current assets are more than the current liabilities will the firm be able to operate efficiently on a day-to-day basis. This ratio should be more than one.



Another ratio is the *net capital ratio* which is the total assets divided by the total liabilities – share capital or equity.

The next ratio is the *current liability ratio* which is the current liabilities divided by the equity. It indicates the firm's immediate financial obligations with respect to its equity and should be less than one. With the passing of years it must decrease further which will indicate the firm is financially healthy.

The ratios discussed above were all derived from the balance sheet. There are some more ratios that can be derived from the income statements. A few are discussed here.

The *Operating ratio* is the total operating expenses divided by the gross income. It is the relationship between the operating cost and the income and reveals how much the firm spends on its operation for a rupee of income. Similarly, the *fixed ratio* is the relationship between the fixed expenses and the gross income and is derived by dividing the former by the latter. The *gross ratio* or the input-output ratio is the total expenses divided by the gross income.

Using the income statement given in this section can you calculate the operating, fixed and gross ratios?

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(Check with the answers given at the end of this section)

All the ratios that we have seen in the previous paragraph are with respect to the actual expenses and income for a particular period, usually one year. There are ratios which are related to the capital investment. Capital investment is the investment required to buy capital assets or fixed assets with which we usually start a firm or business. One such ratio is the *capital turnover ratio*, which is calculated by dividing the gross income by the average capital investment. The average capital investment is the average of the assets at the beginning and the end of the period for which it is being calculated, i.e., the value of assets at the beginning and the end of the year. The *rate of return to investment* is another important ratio. This is obtained by dividing the net return to capital by the average capital investment. The net return to capital is the sum of the net return and the interest payments. The rate of return to capital investment reveals how much net return the firm earns for every rupee invested.

If the average capital investment is Rs. 5,00,000 and the returns are same as for the above, i.e., Rs. 1,27,500, calculate the capital turnover ratio and the rate of return on investment

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(Check with the answers given at the end of this section in Table 7.3)

Calculation for the ratios:

Table 7.3: Calculation of Financial Ratios

Ratio	Formula	Calculation	Result
Operating ratio	Total operating expenses/Gross income	54,000/1,27,500	0.42
Fixed ratio	Fixed expenses/Gross income	25,000/1,27,500	0.20
Gross ratio	Total expenses/Gross Income	79,000/1,27,500	0.62
Capital turnover ratio	Gross income/ Average capital investment	1,27,500/5,00,000	0.26
Rate of return on investment	Net return to capital/Average capital investment (Net return to capital = Net income + interest payments)	(48,500+8,000)/50,000	0.11

7.4 CASH FLOW STATEMENT

You have seen two financial statements in the previous section, the balance sheet and the income statement. We have another important statement, the cash flow statement. The statement or record of the cash flow of a firm over a given period of time is the cash flow statement. The cash flow statement records the cash receipts and the cash expenses of a firm. It may be done with some periodicity, like on a quarterly basis. In short it shows all the cash that is flowing in and out of the firm or business. A cash flow statement is not to be confused with a balance sheet or an income statement. The balance sheet as we have seen earlier is a table showing the assets and liabilities of a firm in two sections, balancing off at the last row on both the sides. The income statement is the statement showing the revenue and expenses from all sources or enterprises, including income and expenses that are as of now only on credit. The cash flow is the inflow and outflow of 'cash' component of the firm. It is a statement which allows us to know how the firm

is operating. It does not include anything that has to do with credit, whether it is sales that have been carried out on credit or whether it is some purchase that has been done on credit. Loans taken for day-to-day or long term operations are however cash receipts, as the cash has been received for that particular activity. Cash flow statement (Table.7.4) shows the cash receipts, the cash expenses and the cash balance for a particular period of time.



Activity 3

Visit a nearby firm/factory/shop and ask the management or person in charge of accounts if you can take a look at their annual financial statements. See if you can find out the cash flow from that.

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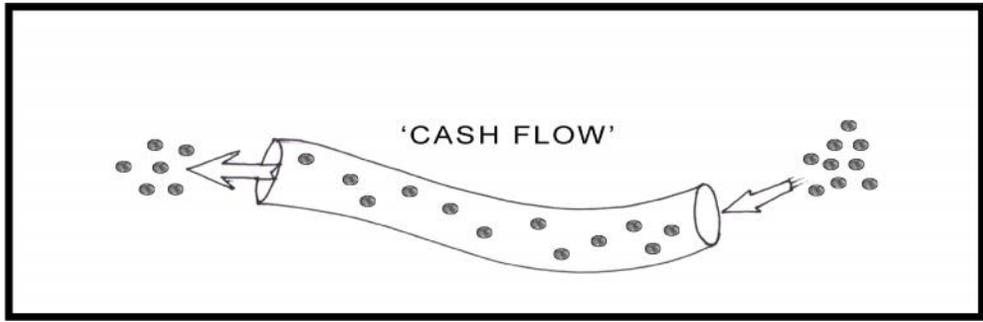
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A hypothetical quarterly cash flow statement is given in Table 7.4:

Table 7.4: Cash Flow Statement

	April- June	July- September	October- December	January- March
Cash receipts				
Sales earnings	1,00,000	60,000	1,10,000	1,00,000
Borrowings or loans	50,000	30,000	20,000	55,000
Depreciation	15,000	13,500	12,150	10,935
Total Cash receipts	1,65,000	1,03,500	1,42,150	1,65,935
Cash expenses				
Operating expenses	1,00,000	1,00,000	1,00,000	1,00,000
Interest payments	30,000	30,000	30,000	30,000
Equipment purchase	15,000	0	0	20,000
Total Cash expenses	1,45,000	1,30,000	1,30,000	1,50,000
Cash balance	20,000	-26,500	12,150	1,59,35

A cash flow statement can also be called a statement showing the net income of the firm along with the depreciation and other cash repayments of credit taken. A cash flow statement is an important tool for day-to-day planning and management of operations. The firm will know exactly what payments are to be paid and when, from where the cash is going to come, how much credit requirement is there, when and how much to sell so that the operations can be maintained etc. While balance sheets and income statements are for longer periods, the cash flow is for the short term. Cash flows are also useful in budgeting.



? Check Your Progress 1

Note: a) Write your answers within the space provided.
 b) Check your answers with those given at the end of the unit.

1) What is budgeting?

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2) What is a balance sheet?

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3) What are current assets and current liabilities?

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4) What are the formulae that are used to derive the following ratios?

1)	Current ratio
2)	Net capital ratio
3)	Current liability ratio
4)	Operating ratio
5)	Fixed ratio
6)	Gross ratio
7)	Capital turnover ratio
8)	Rate of return on investment

5) What is an income statement?

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6) What is a cash flow statement?

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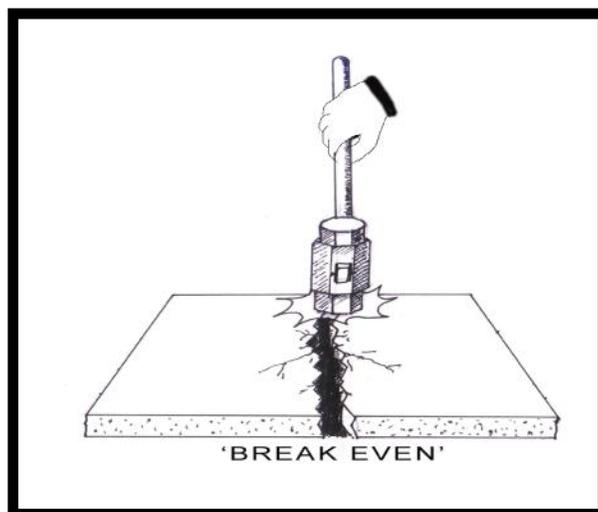
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7.5 BREAK-EVEN ANALYSIS

A major decision that a firm has to take is how much to produce. Every firm produces to maximize profits at minimum costs. When analyzing a firm's production we have the costs and returns. When the costs are exactly equal to the returns, the firm is said to have achieved the 'break-even'.



This is a point (Fig. 7.1) at which the firm is operating at neither a profit nor a loss. The point at which the total cost curve and the total revenue curve intersect is the break-even point and the quantity at that point is the break-even quantity. When the firm sells the product at lower quantities than the break-even it is operating under losses and at a point higher than it, it is making profits. All firms must first reach the break-even point before it can start making profits. There are many methods for calculating the break-even point. One such method is the algebraic method, where $BEP = FC / (P - VC)$, where BEP is the break-even point, FC is the fixed cost, P is the unit price and VC is the unit variable cost.

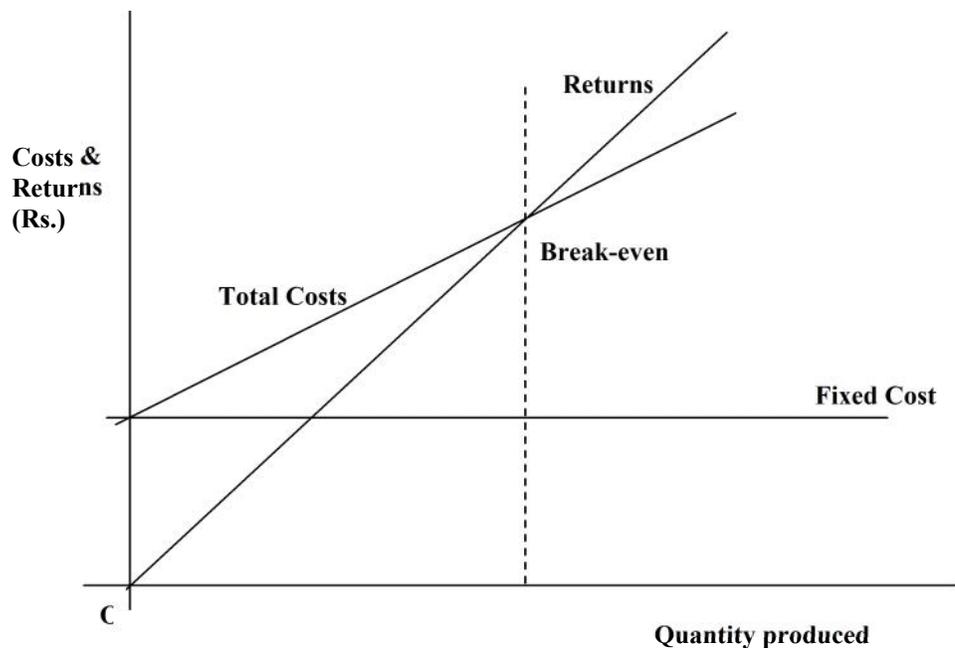


Fig. 7.1: Break Even Point

If the fixed cost for producing a product is Rs. 2,500, the variable cost per unit is Rs. 750 and the price per unit is Rs. 800, the BEP is then calculated as follows:

$BEP = FC / (P - VC) = 2500 / (800 - 750) = 2500 / 50 = 50$ units. The firm will break-even when it produces 50 units of the commodity at this particular price and cost of production.

The BEP may also be computed in monetary terms. Here the formula is $BEP = FC (1 - VC/P)$. For the above example, the Break-even point in monetary terms will be:

$$2500 / (1 - [750/800]) = 2500 / (1 - 0.94) = 2500 / 0.06 = \text{Rs. } 40,000/-$$

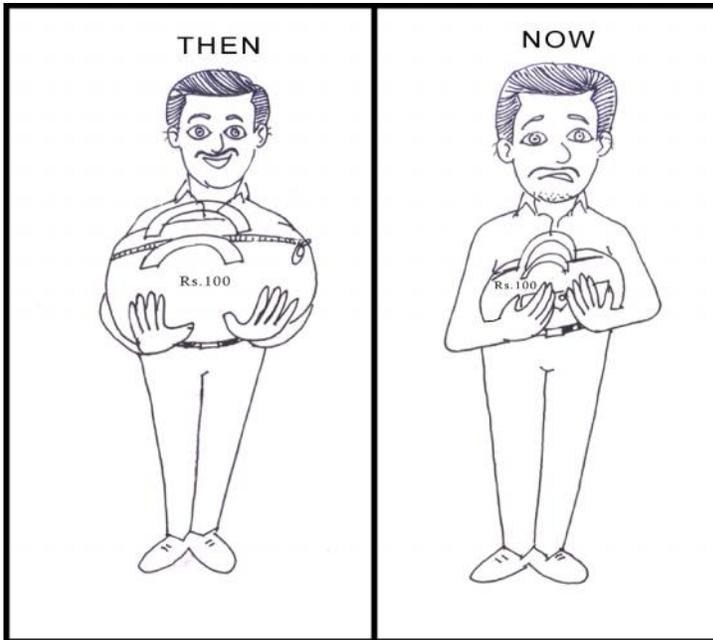
7.6 NET PRESENT VALUE

You have learnt that in any production process a point will be reached which is called the break-even point. At this point the firm will break-even and the costs and returns will be equal.

But before we begin any production process, we must understand that it is a process that will probably run for years. We must carry on the activity for years. A factory producing cars will be doing it for say 100 years or more. There will be changes in technology, models of the cars, labour and technical and the factory itself. But the activity or process of producing the cars will be a long-term one. If we plan a project today, say that of setting up a seafood processing plant producing value added products which we intend to sell initially in the domestic market and then would like to diversify into export market. How do we know today that it will be profitable 5 or 10 years from now? There are various ways or measures as we call them to find out if our project will be a profitable one.

One of the measures is the Net Present Value (Table 7.5). Have you heard people say that with 25 rupees they could buy a kg of pomfret some years back and today you won't get anything with the same amount today? What does that mean? It can mean that the cost of things has increased or in other words it means

that the 'value' of money has decreased. Let us look at this aspect from the point of view of our business. If today we expect an income of Rs. 10,000 and it will remain 10,000 say next year, what will that mean to our costs or investments when we calculated the future income today - how do we do it ? We have to calculate the present value of the 10,000 income that we will get next year along with the Rs. 10,000 that we got this year to know what will be our total income from our investment today. We have seen from our earlier example that the present value of the 10 rupees is different from what it was earlier. When we have to calculate the value of Rs.10 for some years back we have to 'discount' it to that level. We calculate the 'present value' of 'future money' or 'future returns' also in the same way.



Another way of looking at it is this. If we had not invested the money in the firm or project and had put it in a bank, we would have got an income from it in the form of interest. The return we make from the investment may be less than the interest we will get. In a way all 'future money' is converted to current or present money. For the seafood plant, you would have invited investments like land, building, machinery or product lines for a couple of products. You will invest in an efficient treatment plant. You begin production after 6-7 months and have to invest on raw material, on labour, on electricity and water. If you remember unit 2, you can classify the different costs. Do you remember fixed and variable costs?

In the above example what are the fixed and variable costs?

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(Fixed: land, building, machinery; variable: labour, raw material).

The returns in the seafood plant that you have started will begin when production starts 6-7 months after your initial investment began. Your production capacity is actually 3 Metric Tonnes (MT) of products (say frozen shrimp) per day. Initially,

you may not produce to full capacity. You may be only producing say 1.5 MT. You slowly increase it to 2 MT by the next year and 2.5 MT in the third year of operation. Your returns will be thus different during each of these years. So you see your costs and returns will be different during different years of the production process. To know the present value of our project we convert all the future values into current ones. Usually, it is done with reference to the 'present time' though we could theoretically do it, could be with reference to any period during the life of the project.

The best way to understand it is through calculation of your deposits in the bank. If the interest the bank is paying is say 5 per cent, and you have put in Rs. 100 today, what will be the amount due at the end of one year? It will be your deposit multiplied by (1+interest rate), i.e., Rs. 100.

Table 7.5: Net Present Value

Year	Future Income	Present Value of future income at discount rate of 5 per cent	Calculation
1	100	95.24	$100/(1.05)$
2	150	136.05	$150/(1.05)^2$
3	200	172.77	$200/(1.05)^3$
4	250	205.68	$250/(1.05)^4$
5	300	235.06	$300/(1.05)^5$

$(1+[5/100]) = \text{Rs. } 100 \times (1.05) = \text{Rs. } 105$. The present value of future income of Rs. 105 is Rs. 100. Or the future value of your Rs. 100 is Rs. 105. Now if the amount is deposited for two years, the amount will then be $\text{Rs. } 100 \times (1.05)^2$, i.e., Rs.110.25 and for three years it will be $\text{Rs. } 100 \times (1.05)^3$ i.e., Rs. 115.76 and so on. Conversely, if we want to find out the present value of future incomes, we use the same principle, dividing the future income with $(1+\text{interest rate})^t$ where 't' is the number of years. Their $(1+\text{interest rate})^t$ can also be called the discount factor.

If the future incomes are as follows:

The present value of a future income amount is that amount which when invested today will give the future income. If Rs. 95.24 is invested today, it will give Rs. 100 after one year, Rs. 136.05 today would be Rs. 150 after two years and so on (see Table 7.5). We can observe that the present value is dependent on the discount rate (interest rate). If the interest rate or discount rate goes up, the present value of your future income decreases. Look at the same example with a different discount rate, say 6 per cent (Table. 7.6). You see the present value of our future incomes at 6 per cent discount rates is lower than that at 5 per cent discount rate. So the higher the discount rate, lower the present value of future incomes.

Table 7.6: Net Present Value Discount Rates

Year	Future Income	Present Value of Future Income at Discount Rate of 6 per cent	Present Value of Future Income at Discount Rate of 5 per cent
1	100	94.34	95.24
2	150	133.50	136.05
3	200	167.92	172.77
4	250	198.02	205.68
5	300	224.18	235.06

The formula used for calculating the NPV of a project or enterprise is given below, and is the same that we have used for calculation earlier.

$$NPV = \frac{R_1}{(1+r)^1} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \frac{R_n}{(1+r)^n} - C_0$$

Where, $R_1 \dots R_n$ are returns during year 1, ..., n
 r is the discount rate
 C_0 is the initial investment

7.7 COST BENEFIT ANALYSIS

Cost benefit analysis as the term suggests is the analysis of the costs and benefits of any activity that the firm plans to undertake. It should tell us whether the planned action will be beneficial or not. It tells us how much we can save or benefit from the planned activity. Cost benefit analysis can be done for long-term projects as well as for smaller activities within a firm. The expected benefits and costs of a long-term project are usually projected before we start any project. For long-term projects the discounted benefits and the costs can be compared to find out if the project is beneficial. If the cost of a project is going to be Rs. 55 lakhs and the benefits Rs. 65 lakhs, we know that the benefits are more than the costs at first glance. An indicator of this is the benefit-cost ratio which is the present value of benefits divided by the present value of costs. In this case, it is 65/55 which is 1.18. If the BC ratio as it called in short is more, it indicates that the project is cost effective.

For smaller activities, like if a firm decides to invest in new equipment, the cost benefit analysis is broken down into the actual costs and the actual anticipated benefits. If a firm invests in equipment which will do the work that two labour does and also increases the number of units produced by 50 numbers per hour per day. Say If the cost of the equipment is Rs. 20,000. Do you think it will be beneficial? Let us do the cost benefit analysis for this activity that the firm is planning. Let us list out all the costs and benefits (Table 7.7).

Table 7.7: Cost and Benefits

Particulars	Rs.
Cost of equipment	20,000
Installation charges	3,000
Total Revenue expected	75,000
Labour replaced (2 persons @ Rs. 250/day)	3,000
Operator charges	2,500
Electricity charges	350
Insurance for equipment	100

In the above table, we can see that the costs include the cost of equipment, the installation charges, the operator charges, the electricity charges and the insurance for the equipment. This totals to Rs. 25,950. The expected benefits are the total anticipated revenue and the costs of labour replacement that we have saved. This totals to Rs. 78,000. So the benefits will be Rs. 52,050 which is much higher than the costs and so the activity will be beneficial for the firm. So you see we can use the benefit cost analysis for big projects as well as for planning small or big changes at the firm level.

7.8 INTERNAL RATE OF RETURN

The internal rate of return is that discount rate which makes the net present worth zero. That is the net present costs will be exactly equal to the net present benefits at this particular discount rate. While NPV is expressed in value terms, the internal rate of return (IRR) is expressed in percentage terms. It is in a way the break-even discount rate, when the anticipated costs are equal to the anticipated benefits. The IRR must be higher than the current rate of borrowing if the project has to be successful. If by implementing the project the rate at which you are going to earn less than the current interest rates at which you are borrowing the money there is no logic in borrowing money to start your venture. You could as well put in the bank and earn a higher interest. The rate at which your returns will come should compensate for all the risks you undertake while doing the business. Arriving at the rate of interest is the problem here since we do not know the exact rate at which the NPV will be zero. We then take an arbitrary discount rate and work out the NPV. This process is repeated till we get a negative NPV. The value of the IRR will be somewhere between the two interest rates (where we get a positive NPV and a negative NPV). The rate can then be calculated (Table 7.8) using the formula $IRR = \text{Lower discount rate} + \frac{\text{NPV at lower discount rate}}{\text{Difference between NPVs at lower and higher discount rates}}$. This can be better understood with an example. If the net returns of firm are –Rs. 39.6, 19.66, 23, 24.59 and 28.54 lakhs for five years of a project, let us work out the NPV with two different discount rates, one 30 per cent and one 35 per cent. The calculation for the discount factors is the same as we have seen in section 3.7. The last row gives the NPVs. For 30 per cent it is still positive and for 35 per cent it has become negative. So the actual IRR must lie somewhere in between the two rates.

Table 7.8: Basic Calculation to Find Out IRR

Net Returns (Rs. lakhs)	Discount Factor (30 per cent)	NPV (Rs. lakhs)	Discount Factor (35 per cent)	NPV (Rs. lakhs)
-39.6	0.77	-30.46	0.74	-29.33
19.66	0.59	11.63	0.55	10.79
23	0.46	10.47	0.41	9.35
24.59	0.35	8.61	0.30	7.40
28.54	0.27	7.69	0.22	6.36
		7.94		-1.79

It can be calculated using the formula given earlier. Let us look at it step-by-step.

- i) NPV at lower discount rate=7.94 _____(a)
- ii) Absolute difference between NPVs at the lower and higher discount rates
= 7.94 – (-1.79)
= 7.94+1.79= 9.73 _____ (b)
- iii) (a) divided by (b) = 7.94/9.73 = 0.82 _____(c)
- iv) Difference between the lower and higher discount rates = 35–30 = 5____(d)
- v) (c) multiplied by (d) = 5 × 0.82 = 4.08 _____(e)
- vi) Lower discount rate = 30
- vii) Lower discount rate added to (e) = 30 + 4.08 = 34.08

So the calculated IRR in this case is 34.08 per cent. Now it looks fairly simple, isn't it?

These are some measures that are required to analyze the projects that we undertake, whether it is a small fish processing unit or a big export oriented fish product unit.



Check Your Progress 2

Note: a) Write your answers within the space provided.
b) Check your answers with those given at the end of the unit.

1) What is break-even point?
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.....
.....
.....

2) What is the formula for calculating the BEP?
.....
.....
.....
.....

3) Calculate the Breakeven point by both the algebraic method and the monetary method for the costs and returns given below:

Particulars	Rs.
Fixed Cost	4,500
Variable Cost (per unit)	550
Price (per unit)	600

4) Calculate the NPV of a seafood plant at the end of 4 years, with the following cash flows. The capital costs and recurring costs are given. The returns begin to flow in only in the second year and are given in the table. The discount rate is 15 per cent. Calculate the discount factor, PV (Present Worth) of costs (*total costs*) and PV of benefits (total benefits) in the rows provided. The Net Present Worth (NPV) is the PV of benefits minus the PV of cost.

Year	Particulars	I	II	III	IV
1.	Costs (Rs. lakhs)				
	Capital costs	15.62			
	Recurring costs	23.98	10.69	10.69	10.69
	Total costs	39.6	10.69	10.69	10.69
2.	Benefits (Rs. lakhs)				
	Total benefits	0.00	30.35	33.69	35.28
	(Net Returns) Profit/Loss	-39.6	19.66	23	24.59
	DF @ 15 per cent	0.87	0.76	0.66	0.57

5) What is cost-benefit analysis?

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.....

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6) In the example given in section 3.7, calculate the benefit cost ratio.

Particulars	Rs. lakhs
PV of costs	55.73
PV of benefits	65.41
NPV	9.69

.....

.....

7) Calculate the IRR for the firm ABC whose net income is given below. The initial discount rate is 17 per cent and the higher discount rate 20 per cent. Using the formula given in section 3.9, calculate the IRR.

Year	Net income
1	-1,00,000
2	20,000
3	25,000
4	30,000
5	35,000
6	35,000
7	35,000



7.9 LET US SUM UP

Any business or project begins with a lot of planning. Planning involves taking decisions on what to produce, how to produce, how much to produce, at what cost to produce etc. In the process of planning, there are tools to assist us whether our project will be profitable. It is helpful in telling us if our future incomes value will be more than what we are investing today or at the rate we are borrowing to make our investments. Budgeting helps us plan the allocation of our resources among various activities. Budgeting can be done for short-term as well as long term projects. We have financial statements to assess the operation and financial health of a firm or business. It includes the balance sheets, income statements and the cash flow statements. Various ratios can be derived from it to indicate whether we are on the right track. The break-even analysis tells us how much we must produce to be profitable. It is an indicator of a production level when our costs are exactly equal to our returns. The NPV and IRR are ways of knowing how much our future income is worth today. The cost benefit analysis also tells us if the activities we intend to undertake will be profitable in the short or long term. All these measures are used at sometime or the other during the course of the project planning and implementation process. These are tools that help us analyze and assess our projects and see that they are operated profitably.

7.10 GLOSSARY

Balance Sheet	:	A balance sheet is a statement showing the total assets, total liabilities and net worth of a firm. It is an indicator of the solvency of the firm.
Benefit-Cost Ratio	:	An economic indicator of cost effectiveness given by dividing the present value of benefits divided by the present value of costs.
Budget	:	A forecast of the income and expenditure of a firm or any entity for a particular period of time, usually one year.
Budgeting	:	Planning of the allocation of resources among various activities to achieve.
Capital Budgeting	:	The process of determining whether long term investments will be feasible.
Cash Flow Statement	:	The statement or record of the cash flow of a firm over a given period of time is the cash flow statement.
Cost Benefit Analysis	:	The analysis of the costs and benefits of any activity that the firm plans to undertake.
Current Assets	:	Assets that are liquid in the short term or assets that can be converted in cash.

Current Liabilities	:	Liabilities that have to be met in the short term. e.g.: Payments to suppliers or short term loans.
Depreciation	:	The cost kept aside or shown for the decrease in value of a particular fixed asset like building, machinery etc.
Equity	:	Ownership interest in a firm.
Income Statement	:	A statement of the receipts and expenses of a firm. It includes all the income from all enterprises or activities and expenditure, including operating and fixed expenses.
Internal Rate of Return	:	The discount rate at which the net present value is zero or a discount rate at which the net present value of costs is equal to the net present value of benefits, a break-even discount rate.
Liabilities	:	An obligation to pay an amount in money, goods, or services to another party.
Long Term Liabilities	:	Liabilities that need to be met only in the long term. e.g.: Long term loans, development loans.
Long Term or Fixed Assets	:	Assets that can be used in the long term or for several years. e.g.: Land and buildings, machinery.
Net Cash Income	:	Net cash income is the total income minus the total expenses of any firm, in short the profit or loss of a firm.
Net Present Value	:	The present value of future benefits is called the net present value. The net present returns minus the net present costs will give us the Net Present Worth.
Net Worth	:	Net worth is the difference between total assets and total liabilities of a firm.
Partial Budgeting	:	Budgeting of a specific activity for which some change is anticipated or introduced to determine if this will be profitable.
Solvency	:	A position where there is enough cash to meet debts or obligations.



7.11 SUGGESTED FURTHER READING

Mithani, D.M. 1982. *Modern Economic Analysis*, Himalaya Publishing House, Bombay.

Subba Reddy, S. and Raghu Ram, P. 1996. *Agricultural Finance and Management*, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi



7.12 REFERENCES

Mithani, D.M. 1982. *Modern Economic Analysis*, Himalaya Publishing House, Bombay.

Subba Reddy, S. and Raghu Ram, P. 1996. *Agricultural Finance and Management*, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi

7.13 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) Budgeting is the planning of the allocation of resources among various activities to achieve our goals. For a firm it means how to produce, how much to produce, when to produce and at what cost to produce.
- 2) A balance sheet is a statement showing the total assets, total liabilities and net worth of a firm. It is an indicator of the solvency of the firm.
- 3) Current assets are assets that are liquid in the short term or assets that can be converted to cash at short notice. e.g.: cash in hand, produce. Current liabilities: Liabilities that have to be met in the short term. e.g.: payments to suppliers or short term loans.

4) Current ratio =	$\frac{\text{Total current assets}}{\text{Total current liabilities}}$
Net capital ratio =	$\frac{\text{Total assets}}{\text{Total liabilities} - \text{share capital or equity}}$
Current liability ratio =	$\frac{\text{Current liabilities}}{\text{Share capital or equity}}$
Operating ratio	$\frac{\text{Total operating expenses}}{\text{Gross income}}$
Fixed ratio	$\frac{\text{Fixed expenses}}{\text{Gross income}}$
Gross ratio	$\frac{\text{Total expenses}}{\text{Gross Income}}$
Capital turnover ratio	$\frac{\text{Gross income}}{\text{Average capital investment}}$
Rate of return on investment	$\frac{\text{Net return to capital}}{\text{Average capital investment}}$

- 5) An income statement is a statement of the receipts and expenses of a firm. It includes all the income from all enterprises or activities and expenditure, including operating and fixed expenses.
- 6) A cash flow statement is a statement or record of the cash flow of a firm over a given period of time.

Check Your Progress 2

- 1) The point at which the costs are equal to the returns, the firm is said to have achieved the ‘break-even’. This is a point at which the firm is operating at neither a profit nor a loss. The point at which the total cost curve and the total revenue curve intersect is the break-even point and the quantity at that point is the break-even quantity.
- 2) $BEP = FC / (P - VC)$

3)

Particulars	Rs.
Fixed Cost	4500
Variable Cost (per unit)	550
Price (per unit)	600
BEP (Algebraic)	$= 4500 / (600 - 550)$ $= 4500 / 50$ $= 90$
BEP (Monetary)	$= 4500 / (1 - [550/600])$ $= 4500 / (1 - 0.92)$ $= 4500 / 0.08$ $= 54000$

4)

Year	Particulars	I	II	III	IV	
1	Costs (Rs. lakhs)					
	Capital costs	15.62				
	Recurring costs	23.98	10.69	10.69	10.69	
	Total costs	39.6	10.69	10.69	10.69	
2	Benefits (Rs. lakhs)					
	Total benefits	0.00	30.35	33.69	35.28	
	(Net Returns) Profit/Loss	-39.6	19.66	23	24.59	
	DF @ 15 per cent	0.87	0.76	0.66	0.57	
	PV of costs	34.45	8.12	7.06	6.09	55.73
	PV of benefits	0.00	23.07	22.24	20.11	65.41
	NPV					9.69

5) Cost benefit analysis is the analysis of the costs and benefits of any activity that the firm plans to undertake.

6) The solution is as follows:

Particulars	Rs. lakhs
PV of costs	55.73
PV of benefits	65.41
NPV	9.69
Benefit Cost ratio	$= (65.41/55.73) = 1.17$

7) The solution is as follows:

Year	Net income	Discount factor (17 per cent)	NPV	Discount factor (20 per cent)	NVP
1	-100000	0.85	-85470.09	0.83	-71225.07
2	20000	0.73	14610.27	0.69	10146.02
3	25000	0.62	15609.26	0.58	9033.14
4	30000	0.53	16009.50	0.48	7720.63
5	35000	0.46	15963.89	0.40	6415.53
6	35000	0.39	13644.35	0.33	4569.47
7	35000	0.33	11661.84	0.28	3254.61
			2029.03		-30085.68

i	NPV at lower discount rate	2029.03
ii	Absolute difference between NPVs at the lower and higher discount rates	32114.71
iii	(a) divided by (b)	0.06
iv	Difference between the lower and higher discount rates	5.00
v	(c) multiplied by (d)	0.32
vi	Lower discount rate	17.00
vi	Lower discount rate added to (e)	17.32