

## **DETERMINATION OF CASH FLOWS FOR INVESTMENT ANALYSIS**

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### **OBJECTIVES :**

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After going through this lesson you should be able to :

- a) Explain the need for estimation of cash flows
  - b) Distinguish between profit and cash flow
  - c) Calculate the cash flows for evaluating investment proposal.
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### **STRUCTURE :**

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- 7.1 : Introduction
  - 7.2 : Need for estimation of cash flows
  - 7.3 : Cash flows v/s Profit
  - 7.4 : Components of cashflows
  - 7.5 : Computation of cashflows
  - 7.6 : Summary
  - 7.7 : Self examination questions
  - 7.8 : GLOSSARY
  - 7.9 : Books for further reading
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### **7.1 INTRODUCTION**

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In the previous lesson you have studied the nature, meaning and importance of capital budgeting. It is also explained about the types and process of capital budgeting decision making. In this lesson you will be studying the basic principles of estimating cashflows assuming certainty. The procedure for estimating uncertainty in the cashflow estimates is discussed in a later chapter.

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### **7.2 NEED FOR ESTIMATION OF CASH FLOWS**

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As stated in the previous lesson the capital budgeting projects will have long run impact on the firms profitability. Hence, due emphasis should be given in evaluating and selecting the projects. To evaluate the proposed project by applying appraisal techniques, estimation of cash out flows and inflows is necessary.

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### **7.3 CASH FLOWS VERSUS PROFIT**

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The use of evaluation techniques in capital budgeting decision requires information about cash flows. Cash flow may be simply defined as the difference between rupees received and rupees paid out.

Cash flow should not be confused with profit. Changes in profit do not necessarily mean changes in cashflow. Cash flow is not the same thing as profit due to two reasons. First, Profit, as measured by an accountant, is based on accrual concept - revenue is recognised when it is earned, rather than when cash is received, and expense is recognised when it is incurred rather than when cash is paid. In other words, profit includes cash revenues as well as receivables and excludes cash expenses as well as payables.. Second, for computing profit, expenditures are divided into revenue and capital expenditures. Revenue expenses are entirely charged to profits while capital expenditures are not. Capital expenditures are treated as assets and depreciated over their economic life. Only annual depreciation is charged to profit. Depreciation is an accounting entry and does not involve any cash outflow. Thus, measurement of profit excludes some cashflows such as capital expenditures and includes some non-cash items such as depreciation.

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## **7.4 COMPONENTS OF CASH FLOWS :**

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Generally, a typical investment proposal will have three components of cash flows :

### **7.4.1 : (a) : Initial Investment :**

Initial investment is the net cash out lay required to purchase an asset. A major element of the initial investment is the cost of asset and freight and installation charges. When an asset is purchased for expanding revenues, it may require some additional working capital also. Thus, initial investment will be equal to total of gross investment plus net working capital. Further, in case of replacement decisions, sale value of existing assets should be subtracted to arrive at the initial investment.

### **7.4.2 : (b) : Annual net cash inflows :**

An investment proposal is expected to generate annual cash flows from operations after the initial cash out lay has been made. Cash flows should be estimated on an after tax basis.

Computation of after tax cashflows requires a careful treatment of non cash expenses items such as depreciation. Depreciation is an allocation of cost of an asset. It involves an accounting entry and does not require any cash outflow. Depreciation is however, a deductible expense for computing taxes. In the process of calculation of cash flows depreciation does not have any direct impact but indirectly influence cashflows since it reduces the firms tax liability. The savings resulting from depreciation is called depreciation tax shield. Since the depreciation is a not cash item, it should be added back to the net profit after taxes to get the net cash flow.

Similarly, while calculating net cashflows change in the net working capital and cash outflows for capital expenditure in the middle of the life of the project should be deducted. Thus the definition of net cashflow will be :

$$NCF : EBIT (1-t) + DEP - NWC - \text{Capital expenditure in the middle of the life of the project.}$$

### **7.4.3 Terminal cash flows :**

The above equation provides a general definition of net cash flows in any particular year. However, the last or terminal year of an investment may have additional cash flows. Salvage value and release net working capital are the examples of terminal cash flows. In the process of calculating net cashflows salvage value and release of net working capital should be added to the last year cash flow. In case of replacement of an asset, Salvage value of old asset will reduce the initial outlay of the new asset.

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## **7.5 COMPUTATION OF CASHFLOWS**

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In the foregoing paragraphs it is described that cashflow includes three components i.e. initial investment, annual net cash inflows and terminal cashflows. It is also discussed

In detail about the treatment of certain items like depreciation, salvage value and release of net working capital. Calculation of cashflows of a typical investment proposal is explained through the following illustrations.

### ILLUSTRATION : 1

A project costs Rs.25,000/- and has a scrap value of Rs. 5,000/- after 5 years . The net profits before depreciation and taxes for the five years period are expected to be Rs.5,000/- Rs. 6,000/- Rs.7,000/- Rs.8,000/- and Rs.10,000/- You are required to calculate net cashflows. Assume tax rate as 50 %.

### SOLUTION :

Cost of the project Rs. 25,000 /-

Life of the project 5 Years

Calculation of depreciation :

$$\text{Depreciation} = \frac{\text{Investment} - \text{Scrap Value}}{\text{Life}}$$

$$= \frac{25000 - 5000}{5} = \frac{20,000}{5} = \text{Rs. 4,000 /-}$$

calculation of net cashflows :

Year	CFBT	-	DEP	=	NP	-	TAX	=	PAT	+	DEP	=	CFAT
	Rs		Rs		Rs		Rs		Rs		Rs		Rs
1	5000	-	4000	=	1000	-	500	=	500	+	4000	=	4500
2	6000	-	4000	=	2000	-	1000	=	1000	+	4000	=	5000
3	7000	-	4000	=	3000	-	1500	=	1500	+	4000	=	5500
4	8000	-	4000	=	4000	-	2000	=	2000	+	4000	=	6000
5	10000	-	4000	=	6000	-	3000	=	3000	+	4000	=	7000

Abbreviations :	CFBT	=	Cashflows before tax
	DEP	=	Depreciation
	NP	=	Net Profit
	TAX	=	Tax on net Profit
	PAT	=	Profit after tax
	CFAT	=	Cashflows after tax or Net cashflows.

### ILLUSTRATION :2

The Phillips Corporation, which has 50 per cent tax rate is evaluating a project which will cost Rs.1,00,000/- and will required an increase in the level of inventories and receivables of Rs.50,000/- over its life. The Project will generate additional sales of Rs.1,00,000/- and will require cash expenses of Rs.30,000/- in each year of its five year life: it will be depreciated on a straight line basis. Calculate the projects initial investment and net cash flows over its life.

**Solution :****(a) Calculation of initial investment**

Project cost	Rs. 1,00,000
+ Working Capital Required	Rs. 50,000
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Total initial investment	Rs. 1,50,000
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**(b) Calculation of CFBT :**

Additional sales revenue	Rs. 1,00,000
-Cash expenses	Rs. 30,000
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CFBT	Rs. 70,000
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**(c) Calculation of Depreciation :**

$$\text{Depreciation} = \frac{1,00,000 - 0}{5} = 20,000$$

**(4) Calculation of CFAT**

Year	CFBT	-	DEP	=	NP	-	tax	=	PAT	+	DEP	=	CFAT
	Rs		Rs		Rs		Rs		Rs		Rs		Rs
1	70,000	-	20,000	=	50,000	-	25,000	=	25,000	+	20,000	=	45,000
2	70,000	-	20,000	=	50,000	-	25,000	=	25,000	+	20,000	=	45,000
3	70,000	-	20,000	=	50,000	-	25,000	=	25,000	+	20,000	=	45,000
4	70,000	-	20,000	=	50,000	-	25,000	=	25,000	+	20,000	=	45,000
5	70,000	-	20,000	=	50,000	-	25,000	=	25,000	+	20,000	=	45,000

Net Cash Flow are

Year	Cashflows
1	45,000
2	45,000
3	45,000
4	45,000
5	95,000 * (45,000 + 50,000)

\* 5th year net cash flow includes annual inflow of Rs. 45,000/- plus release of networking capital of Rs. 50,000/-

**ILLUSTRATION : 3**

A company is considering two mutually exclusive projects. Both require an initial outlay of Rs. 10,000 each and have a life of five years. The companies required rate of return is 10 per cent and pays tax at a 50 percent rate. The projects will be depreciated on straight line basis. The before tax cash flows expected to be generated by the projects are as follows :

Year		1	2	3	4	5
Project A	Rs.	4,000	4,000	4,000	4,000	4,000
Project B	Rs.	6,000	3,000	2,000	5,000	5,000

Compute the net cash flows for each project.

**Solution :**

**Project : A**

Since the project A cash flows before tax are uniform, net cash flows can be calculated as follows:

1) Calculation of depreciation

$$\text{Depreciation} = \frac{10,000 - 0}{5} = 2,000$$

2) Calculation of net cash flows : (CFAT)

Year	CFBT	-	DEP	=	NP	-	TAX	=	PAT	+	DEP	=	CFAT
	Rs		Rs		Rs		Rs		Rs		Rs		Rs
1-5	4,000	-	2,000	=	2,000	-	1,000	=	1,000	+	2,000	=	3,000

**Project B:-**

Since CFBT is not uniform net cashflows are to be calculated year wise

1. Calculation of depreciation

$$= \frac{10,000 - 0}{5} = 2,000$$

2. Calculation of CFAT

YEAR	CFBT	DEP	NP	TAX	PAT	DEP	CEAT
	Rs	Rs	Rs	@ 50%	Rs	Rs	Rs
1	6,000	2,000	4,000	2,000	2,000	2,000	4,000
2	3,000	2,000	1,000	500	500	2,000	2,500
3	2,000	2,000	0	0	0	2,000	2,000
4	5,000	2,000	3,000	1,500	1,500	2,000	3,500
5	5,000	2,000	3,000	1,500	1,500	2,000	3,500

## 7.6 SUMMARY

The estimation of cashflows is most difficult and crucial step in investment analysis. Cash flows are different from profits. Profit is not necessary cash flows it is the difference between revenue earned and expenses incurred rather than cash received and cash paid. Also in the calculation of profits an ordinary distinction between revenue and capital expenditure is made.

The components of cashflows are (1) Initial investment (2) Annual net cash flows (3) Terminal cash flows. In the process of calculating net cash flows certain items like depreciation, salvage value net working capital are to be adjusted.

## 7 SELF EXAMINATION QUESTIONS

- a. Distinguish between cash flows and Profit
  - b. What are the components of cash flows
  - c. How do you treat the following items while calculating net cashflows:
    - i) Depreciation
    - ii) Salvage Value
    - iii) Net working capital
  - d. Practical Problems
- 1/ A project cost Rs. 1,00,000 and has a scrap value of Rs. 20,000 After 5 years. Additional installation charges of Rs. 10,000 and working capital of Rs. 30,000 required. The net profits before depreciation and taxes for the five years are expected to be Rs. 15,000 Rs. 25,000 Rs. 30,000 Rs. 40,000 and Rs. 45,000 . Assuming 50 % rate of tax and depreciation on straight line method. Calculate the net cash flows for the project.
- 2/ A project costing Rs. 10 lakhs has a life of 10 years at the end of which its scrap value is likely to be Rs. one lakh. The project is expected to yield an annual profit before tax of Rs. 1,00,000 depreciation being charges on straight line basis. Assumes 50 % tax rate. Calculate the net cash flows for the project.

3. From the following information estimate the net cash flows for each project.

Project	A	B
Cost	Rs 30,000	Rs 30,000
Life	5 years	5 years
Year	CFBT	CFBT
	Rs.	Rs.
1	10,000	15,000
2	10,000	9,000
3	10,000	6,000
4	10,000	12,000
5	10,000	10,000

Depreciation is to be charged on straight line basis assume tax rate as 50 per cent.

## 7.8 GLOSSARY

Cash Flow	:	Cash flow is the difference between rupees received and rupees paid at
Profit	:	Profit is the difference between revenue earned and expenses incurred
Depreciation tax shield	:	The savings resulting from depreciation is called depreciation tax shield.

## 9 BOOKS FOR FURTHER READING

Pandey I.M.	:	Financial Management, Vikas Publishers, New Delhi , 7th Ed. 1995
Khan & Jain	:	Financial Management, Tata Mc Graw Hill Publishing Co., New Delhi, 2nd Ed., 1995.