BBA-604

WORKING CAPITAL MANAGEMENT

DIRECTORATE OF DISTANCE EDUCATION

SWAMI VIVEKANAND

SUBHARTI UNIVERSITY

Meerut (National Capital Region Delhi)

Contents

SYLLABUS

Working Capital Management

Course Code: BBA - 604		
Course Credit:	Lecture: 04	Tutorial: 1
Course Type:	DSE	
Lectures delivered:	30 L + 10 T	

End Semester Examination System

Maximum Marks Allotted	Minimum Pass Marks	Time Allowed
70	28	3:00 HOURS

Continuous Comprehensive Assessment (CCA) Pattern

Minor Tests(marks)	Assignment/ Tutorial/ Presentation	Attendance	Total
15	5	10	30

Course Objective: To enable the students to develop understanding about working capital management and its functioning in businesses

UNIT	Content	Hours
I	Introduction – Meaning and Components of Working Capital, Gross and Net Working Capital, Permanent and Temporary Working Capital, Positive and Negative Working Capital, Objectives of Working Capital Management. Concept of Operating Cycle.	10
II	Working Capital Requirement – Factors determining Working Capital, Working Capital in Seasonal Industries, Working Capital during Inflation, Working Capital in Industries with shift working.	14
III	Inventory Management – Meaning and Nature of Inventory, Purpose / Benefits of Holding Inventory, Risk and Costs of Holding Inventories, Meaning and Objectives of Inventory Management. Tools and Techniques of Inventory Management	12
IV	Receivables Management – Meaning of Receivables, Cost of Maintaining Receivables, Factors influencing size of Receivables, Forecasting the Receivables, Meaning and Objectives of Receivables Management, Dimensions of Receivables Management: Forming of Credit Policy, Executing the Credit Policy, Formulating and Executing Collection Policy.	12
V	Cash Management – Nature of Cash, Motives of Holding Cash, Cash Management, Managing cash flows, Determining Optimum Cash Balance.	12

Course Outcomes: After studying this course the student should be able to

1. Identify the key themes in working capital management.
2. Understand the role of working capital in an organization.
3. Analyse the working capital requirements of various type of requirements.
4. Analyse the relationship between working capital management and corporate financing decisions.

Text Books:

1. Bhattacharya, H. Working Capital Management. New Delhi: Prentice-Hall of India.
2. Kishore, R. M. Financial Management. New Delhi: Taxmann Publication

Reference Books:

1. Mathur, S. B. Working Capital Management & Control. New Delhi: New Age International.
2. Rustagi, R. P. Working Capital Management. New Delhi: Taxmann Publication

Unit–1

Introduction to Working Capital Management

Notes

Structure

1.1. Introduction

One of the most important area in the day-to-day management of the firm is the management of working capital. Working capital management is the functional area of finance that covers all the current accounts of the firm. It is concerned with the management of the level of individual current assets as well as the management of total working capital. Procurement of funds is firstly concerned for financing working capital requirement of the firm, secondly for financing fixed assets.

Working capital refers to the funds invested in current assets, i.e., investment in stocks, sundry, debtors, cash and other current assets. Current assets are essential to use fixed assets profitably.

Working capital management is concerned with the problems that arise in attempting to manage the current assets, the current liabilities and interrelationship that exist between them. The term current assets refer to those assets which in the ordinary cause of business can be, or will be converted into cash within one year, without undergoing a diminution in value and without distrupting the operations of the firm. The major current assets are cash, marketable securities, accounts receivable and inventory. Current liabilities are those liabilities which are intended at their inception to be paid in the ordinary course of business, within a year, out of the current assets or earnings of the concern. The basic current liabilities are accounts payable, bills payable, bank overdraft and outstanding expenses.

"The goal of working capital management is to manage the firm's current assets and liabilities in such a way that a satisfactory level of working capital is maintained." This is so because if the firm cannot maintain a satisfactory level of working capital. It is likely to become investment and may even be forced into bankruptcy. The current assets should be large enough to cover its

current liabilities in order to ensure a reasonable margin of safety. Each of the current assets must be managed efficiently in order to maintain the liquidity of firm while not keeping too high a level of any one of them.

Each of the short-term sources of financing must be continuously managed to ensure that they are obtained and used in the best possible way.

"The interaction between current assets and current liabilities is therefore the main theme of the theory of working capital management."

The basic ingredient of the theory of working capital management may be said to include its definition, need, optimum level of current assets, the trade off between profitability and risk which is associated with the level of current assets and liabilities, financing-mix strategies and so on.

Note: The requirements of current assets are usually greater than the amount of funds payable through current liabilities. In other words, the current assets are to be kept at a higher level than the current liabilities.

1.2. CONCEPTS AND DEFINITIONS OF WORKING CAPITAL

There are many classifications in use out of which a few important areas are as below:

(*i*) From the point of view of concept

(*ii*) From the point of view of time.

From the point of view of concept the term working capital can be used in two different ways:

(*a*) Gross Working Capital (GWC)

(*b*) Net Working Capital (NWC)

The term gross working capital refers to investment in all the current assets taken together. The total of investments in all current assets is known as gross working capital.

The term net working capital can be defined in following two ways:

1. The most common definition of net working capital (NWC) is the difference between current assets and current liabilities.

$$NWC = CA - CL$$

where

CA = Current Assets

CI = Current Liabilities

2. The alternate definition of NWC is that portion of current assets which is financed with long-term funds. (Means part of those current assets whose liability does not lie with current liabilities).

NWC is commonly defined as the difference between current assets and current liabilities. Efficient working capital management requires that firms should operate into same amount of NWC, the exact amount varying from firm to firm and depending among other things, on the nature of industry.

The justification for the use of NWC to measure liquidity is based on the premise that the greater the margin by which the current assets cover the short-term obligations, the more is the ability to pay obligations when they become due for payment.

The NWC is necessary because the cash outflows and inflows do not coincide. In other words, it is the non-synchronous nature of case flows that makes NWC necessary.

In general, the cash outflows resulting from payment of current liabilities are relatively predictable. The cash inflows are, however, difficult to predict.

Note: (*i*) The more predictable the cash inflows are the less NWC will be required.

(*ii*) Where cash inflows are uncertain, it will be necessary to maintain current assets at a level adequate to cover current liabilities that is there must be NWC.

The task of the financial manager in managing working capital efficiently is to ensure sufficient liquidity in the operations of the enterprise. The liquidity of a business firm is measured by its ability to satisfy short-term obligations as they become due. The three basic measures of a firm's overall liquidity are:

(*i*) Current ratio

(*ii*) Acid test ratio

(*iii*) Net working capital

The first two measures are very useful in inter-firm comparison of liquidity. Net Working Capital (NWC) as a measure of liquidity is not very useful for comparing the performance of different firms but it is quite useful for internal control. The NWC helps in comparing the liquidity of the same firm overtime. For the working capital management, NWC can be said to measure the liquidity of the firm. In other words, the goal of working capital management is to manage the current assets and current liabilities in such a way that an acceptable level of NWC is maintained.

From the Point of View of Time

From the point of view of time, working capital can be divided into following two categories:

(*a*) Permanent working capital

(*b*) Temporary working capital

(*a*) **Permanent Working Capital:** It also refers to the hard core working capital. It is that minimum level of investment in the current assets that is carried by the business at all times to carry out minimum level of its activities.

(*b*) **Temporary Working Capital:** It refers to that part of total working capital which is required by a business over and above permanent working capital. It is also called variable working capital.

Note: Since the volume of temporary working capital keeps on fluctuating from time to time according to the business activities it may be financed from short-term services.

Notes

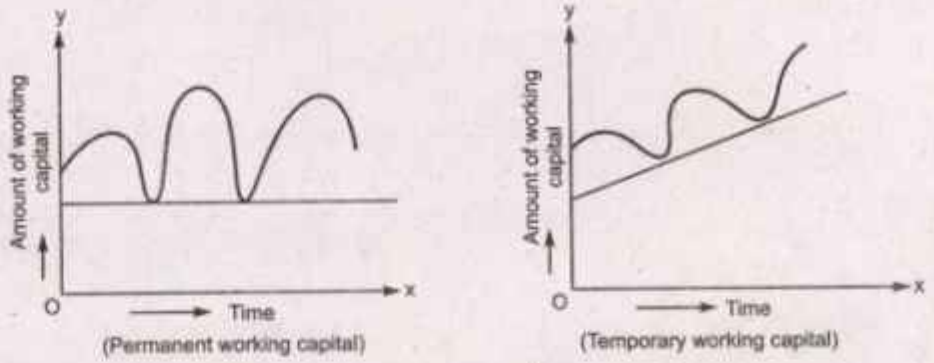


Fig. 1.1

1.3. WORKING CAPITAL CYCLE

Working capital cycle refers to the length of time between the firms paying cash for materials, etc., entering into the production process/stock and the inflow of cash from debtors *i.e.*, sales.

Suppose a company has a certain amount of cash it will need raw materials. Some raw materials will be available on credit but, cash will be paid out from the other part immediately. Then it has to pay labour costs and incurs factory overheads. These three combined together will constitute work-in-progress. After the production cycle is complete, work-in-progress will get converted into finished products.

The finished products when sold on credit gets converted into sundry debtors. Sundry debtors will be realized in cash after the expiry of credit period. This cash can again be used for financing of raw materials, work-in-progress etc.

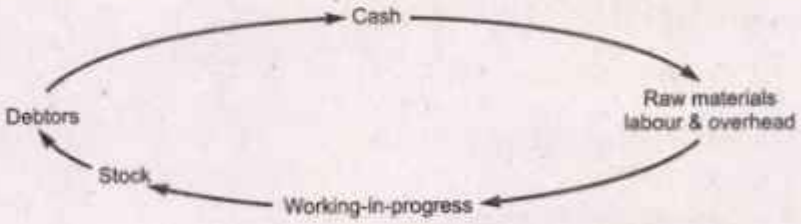


Fig. 1.2

Thus there is a complete cycle from cash to cash wherein cash gets converted into raw materials, work-in-progress, finished goods, debtors and finally into cash again.

Notes

Notes:
1. Short-term funds are required to meet the requirements of funds during this time period.
2. This time period is dependent upon the length of time within which the original cash gets converted into cash again.
3. This cycle is also known as operating cycles or cash cycle.

Working capital cycle indicates the length of time between a company's paying for materials, entering into stock and receiving the cash from sales of finished goods. It can be determined by adding the number of days required for each stage in the cycle.

Example: A company hold raw-material on an average for 60 days, it gets credit from the supplier for 15 days, production process needs 15 days, finished goods are held for 30 days and 30 days credit is entered to debtors.

Then, total no. of days = 60 – 15 + 15 + 30 + 30 = 120 days means 120 days is the total working capital cycle.

The determination of working capital cycle helps in the forecast, control and management of working capital. It indicates the total time lag and the relative significance of its constitutent parts. The duration of working capital cycle may vary depening on the nature of the business.

The operating cycle (working capital cycle) consists of the following events which are continue throughout the life of business:

1. Conversion of cash into raw materials
2. Conversion of raw materials into work-in-progress
3. Conversion of work-in-progress into finish stock
4. Conversion of finished stock into account receivables through sales
5. Conversion of accounts receivables into cash.

The duration of the operating cycle for the purpose of estimating working capital is equal to the sum of the durations of each of the above said events, less (–) the credit period allowed by the supplier.

In the form of an equation, the operating cycle process can be expressed as follows:

Operating cycle = R + W + F + D – C

where

R = Raw material storage period
W = Work-in-progress holding period
F = Finished goods store period
D = Debtors collection period
C = Credit period availed

Various components of the operating cycle can be calculated:

R = Raw materials storage period

Notes

$$= \frac{\text{Average stock raw materials}}{\text{Average cost of raw material consumption/day}}$$

W = Work-in-progress holding period

$$= \frac{\text{Average work-in-progress inventory}}{\text{Average cost of production/day}}$$

F = Finished goods storage period

$$= \frac{\text{Average stock of finished goods}}{\text{Average cost of goods sold per day}}$$

D = Debtors collection period

$$= \frac{\text{Average book debts}}{\text{Average credit sales/day}}$$

C = Credit period availed

$$= \frac{\text{Average trade creditors}}{\text{Average credit purchases/day}}$$

1.4. SUMMARY

- Working capital refers to the funds invested in current assets, i.e., investment in stocks, sundry, debtors, cash and other current assets. Current assets are essential to use fixed assets profitably.
- From the point of view of concept the term working capital can be used in two different ways:
  - (*a*) Gross Working Capital (GWC)
  - (*b*) Net Working Capital (NWC)
- The term gross working capital refers to investment in all the current assets taken together. The total of investments in all current assets is known as gross working capital.
- NWC is commonly defined as the difference between current assets and current liabilities.
- The task of the financial manager in managing working capital efficiently is to ensure sufficient liquidity in the operations of the enterprise.
- From the point of view of time, working capital can be divided into following two categories:
  - (*a*) Permanent working capital
  - (*b*) Temporary working capital
- Working capital cycle refers to the length of time between the firms paying cash for materials, etc., entering into the production process/ stock and the inflow of cash from debtors i.e., sales.

- Working capital cycle indicates the length of time between a company's paying for materials, entering into stock and receiving the cash from sales of finished goods.

1.5. SELF-HELP QUESTIONS

Notes

1. Working capital management deals with decisions regarding the appropriate mix and level of current assets and current liabilities. Elucidate the statement.
2. Why length of operating cycle is considered as a major determinant of working capital requirement? Explain.
3. Distinguish between
   (*a*) Gross working capital and net working capital
   (*b*) Permanent and temporary working capital
   (*c*) Production cycle and operating cycle.

1.6. SELF-EXAMINATION QUESTIONS

1. Define working capital. Distinguish between gross working capital and net working capital.
2. Write short notes on:
   (*i*) Optimum working capital (*ii*) Operating cycle
3. What do you mean by working capital management? Explain how working capital management policies affect profitability, liquidity and structural health.

Notes

Unit–2

Working Capital Requirement

Structure

2.1. INTRODUCTION

An adequate amount of working capital is essential for the smooth running of a business enterprise. The finance manager should forecast working capital requirements carefully to determine an optimum level of investment in working capital.

Note: While forecasting working capital requirements, it should be borne is mind that working capital requirements are to be determined on an average basis not at any specific point of time.

Following are the methods for forecasting of working capital requirements:

(*a*) On the basis of operating cycles.

(*b*) On the basis of current assets and current liabilities.

(*c*) On the effect of double shift working.

(*d*) On the basis of cash cost.

2.1.1 On the Basis of Operating Cycles

One of the method for forecasting working capital requirement is based on the concept of operating cycle.

The calculation of operating cycle and the formula for estimating working capital on its basis has been determined with the help of following example.

Example: From the following information of ABC Ltd. calculate (*a*) Net operating cycle period (*b*) Number of operating cycles in a year.

		₹
(*i*)	Raw material inventory consumed during a year	6,00,000
(*ii*)	Average stock of raw material	50,000
(*iii*)	Work-in-progress inventor	5,00,000
(*iv*)	Average work-in-progress inventory	30,000
(*v*)	Finished goods inventory	8,00,000
(*vi*)	Average finished goods stock held	40,000
(*vii*)	Average collection period from debtors	45 days
(*viii*)	Average credit period availed	30 days
(*ix*)	No. of day in a year	360 days

Solution:

(*i*) Calculation of Net operating cycle period of ABC Ltd.

R = Raw material storage period
= average stock of raw material/average cost of raw material consumption/day
= 50,000/6,00,000/360
= 50,000 × 360/6,00,000
= 30 days.

W = Work-in-progress holding period
= average work-in-progress inventory/average cost of production/day
= 30,000/500,000/360
= 30,000 × 36/500,000 = 22 days

F = Finished goods storage period.
= average stock of finished goods/average cost of goods sold/day
= 40,000/8,00,000/360
= 40,000 × 360/8,00,000
= 18 days

D = Debtor collection period = 45 days

Total operating cycle period = R + W + F + D – C

R + W + F + D = 30 + 22 + 18 + 45 = 115 days.

C = average credit period availed = 30 days

Then,

Operating cycle period = 115 – 30 = 85 days.

(*ii*) Number of operating cycles in a year = 360/85

= 4.2 cycles.

Notes

Notes

2.1.2 On the Basis of Current Assets and Current Liabilities

The estimation of future working capital can be made if the amount of current assets and current liabilities can be estimated as below.

Various components of current assets and current liabilities have a direct bearing on the computation of working capital and its operating cycle. The holding period of various constituents of operating cycle may contract or expand the net operating cycle period.

Note: 1. Shorter the operating cycle period will lower the requirement of working capital and vise-versa.

Operating cycle period ∝ requirement of working capital

Estimation of current assets

The estimates of various components of working capital may be made as below:

(*i*) **Raw materials inventory:** The fund to be invested in raw materials inventory may be estimated on the basis of production budget. The estimated cost per unit and average holding period of raw material inventory by using the following formula.

$$\text{Raw material inventory} = \frac{(\text{Estimated production} \times \text{Estimated cost of raw material})}{\text{12 moths/360 days}} \times \text{Average raw materials holding period}$$

Note: If the number of days are not given generally 360 days is taken to facilitate calculation.

(*ii*) **Work-in-progress inventory:** The funds to be invested in work-in-progress can be estimated by the following formula.

$$\text{Work in progress inventory} = \frac{(\text{Estimated production} \times \text{Estimated work-in-progress})}{\text{12 moths/360 days}} \times \text{Average holding period of WIP}$$

(*iii*) **Finished goods:** The funds to be invested in finished goods inventory can be estimated with the help of following formula.

$$\text{Finished goods inventory} = \frac{[\text{Estimated production} \times (\text{Cost of production} - \text{depreciation})]}{\text{12 months/360 days}} \times \text{Average holding period of finished goods inventory}$$

(*iv*) **Debtors:** Funds to be invested in trade debtors may be estimated with the help of following formula.

$$\text{Debtors} = \frac{[\text{Estimated credit sales} \times (\text{Cost of sales} - \text{depreciation})]}{\text{12 months/360 days}} \times \text{Average debtors collection period}$$

(*v*) Minimum Desired Cash and Bank balances to be maintained by the firm has to be added in the current assets for the computation of working capital.

Estimation of current liabilities

Current liabilities generally effect computation of working capital. Hence, the amount of working capital in lowered to the extent of current liabilities (other than bank credit) arising in the normal cause of business. The important current liabilities like trade creditors, wages and salaries, overhead etc., can be estimated as below:

(*i*) Trade creditors:

$$\left\{\frac{\text{Estimated yearly production (in units)} \times \text{Raw Material requirements per unit}}{\text{12 moths/360 days}}\right\} \times \text{Credit-period granted by supplier (month/days)}$$

(*ii*) Direct wages:

$$\left\{\frac{\text{Estimated production (in units)} \times \text{Direct labour cost/unit}}{\text{12 months/360 days}}\right\} \times \text{Average time lag in payment of wages (month/days)}$$

(*iii*) Overheads (other than depreciation and amortisation):

$$\left\{\frac{\text{Estimated yearly production (in units)} \times \text{Overheads cost per units}}{\text{12 months/360 days}}\right\} \times \text{Average time lag in payment of overheads (months/days)}$$

Note: (*i*) The amount of overheads may be separately calculated for different types of overheads.

(*ii*) In case of selling overheads, the relevant item would be sales volume instead of production volume.

Notes

Example: On 1st April, the Managing Director of XYZ Ltd. wishes to know the amount of working capital that will be required during the financial year. From the following information prepare the working capital requirements forecast.

Production during the previous year was 60,000 units. It is planned that this level of activity would be maintained during the current financial year. The expected ratios of cost to selling price are Raw Materials 60%, Direct Wages 10%, Overheads 20%. Raw materials are expected to remain in store for an average of 2 months before issue to production. Each unit is expected to be in process for one month, the raw materials being fed into the pipeline immediately and the labour and overhead costs accuring evenly during the month. Finished goods will stay in the ware house awaiting despatch to customers for approximately 3 months. Credit allowed by creditors is 2 months from the date of delivery of raw materials. Credit allowed to debtors is 3 months from the date of despatch. Selling price is ₹ 5 unit. There is a regular production and sales cycle. Wages and overheads are paid on the 1st of every month for the previous month. The company normally keeps cash in hand to the extent of ₹ 20,000.

Solution:

(*i*) **Raw material inventory:** The cost of materials for the whole year is 60% of the sales value Hence,

$$60{,}000 \times 5 \times \frac{60}{100} = 600 \times 5 \times 60$$

$$= ₹\ 1{,}80{,}000$$

Monthly consumption of raw materials (average) = 1,80,000/12 = ₹ 15,000
Requirement of raw materials for the 2 months = 15,000 × 2 = ₹ 30,000

(*ii*) **Debtors:** The average sales per month

$$= \frac{60{,}000 \times 15}{12} = ₹\ 3{,}00{,}000/12$$

$$= ₹\ 25{,}000$$

There is a time limit of 3 months from the date of despatch of goods to the debtors. Then amount of debtors (sundry) = 3 × 25,000

= ₹ 75,000

(*iii*) **Work-in-progress:**

(Each unit of production is expected to be in process for one month).

(*a*) Raw material in WIP ₹ 15,000.00

(Being one month's raw material requirements)

(*b*) Labour costs in WIP ₹ 1,250

(It is given that it occurs evenly during the month. Thus, on the 1st day of each month it would be zero and on the last day of month the WIP would include one month's labour costs. On an average therefore, it would be equivalent to 1/2 of the months labour cost).

(c) Overheads		₹ 2,500.00
(for 1/2 month as explained above)		
Total WIP		₹ 18,750.00

(iv) **Finished goods inventory:** (3 months cost of productions)

Raw materials (15,000 × 3)		45,000.00
Labour (2,500 × 3)	=	7,500.00
Overheads (5,000 × 3)	=	15,000.00
		₹ 67,500.00

(v) **Creditors:** Suppliers allow a two months credit period. Hence, the average amount of creditors would be 2 × 15,000 = ₹ 30,000 being two months purchase of raw materials.

(vi) **Direct wages payable:** The direct wages the whole year is 60,000 $\times 5 \times \frac{10}{100}$ = ₹ 30,000 therefore monthly direct wages = 30,000/12 = ₹ 2500

(vii) **Overheads payable:** The overheads for the whole year is 60,000 × 5 $\times \frac{20}{100}$ = ₹ 60,000 then, monthly overheads = 60,000/12 = ₹ 5,000

Computation of working capital requirement

Current assets

	₹
Raw materials inventory (*i*)	30,000
Debtors (*ii*)	75,000
WIP (*iii*)	18,750
Finished goods inventory (*iv*)	67,500
Cash (given in problem)	20,000
Total current assets	2,11,250
Current liabilities	
Creditors (*v*)	30,000
Direct wages payable (*vi*)	2,500
Overheads payable (*vii*)	5,000
Total current liabilities	37,500

Estimated working capital requirements = Current assets – Current liabilities

= 2,11,250 – 37,500 = ₹ 1,73,750

2.1.3 On the Effect of Double Shift Working

Increase in the number of hours of production has an effect on the working capital requirements. The greatest economy in introducing double shift is the greater use of fixed assets.

Note: Very little as marginal funds may be required for additional assets.

It is obvious that in double shift working, an increase in stock will be required as the production rises. However, it is quite possible that the increase may not be proportionate to the rise in production since the minimum level of stocks may not be very much higher. Thus, it is quite likely that the level of stocks may not be required to be doubled as the production goes up-two fold.

The amount of materials in process will not change due to double shift working since work started in the 1st shift will be completed in the second. Hence, capital tied up in materials in process will not change unless the 2nd shift workers are paid at the higher rate.

Notes:
1. Fixed overheads will remain forced whereas variable overheads will increase in proportion to the increased production.
2. Semi-variable overheads will increase according to the variable element in them.
3. Unless specified in a situation, generally stock of raw materials is presumed to be increased proportionality.

Example: M/s Rama & Co. has been operating its manufacturing facilities till 31.3.2009 on a single shift working with the following cost structure.

	Per unit (₹)
Cost materials	6.00
Wages (40% fixed)	5.00
Overheads (80% fixed)	5.00
Profit	2.00
Selling price	18.00

Sales during 2008-09 – ₹ 4,32,000

As on 31.3.09 the company held

	₹
Stock of raw material (at cost)	36,000
WIP (Valued at prime cost)	22,000
Finished goods (valued at total cost)	72,000
Sundry debtors	1,08,000

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same the credit period allowed to customers will also remain unaltered. Credit availed of from suppliers will continue to remain at the present level *i.e.*, 2 months. Lag in payment of wages and expenses will continue to remain ½ month.

Assess the additional working capital requirement of the policy to increase output is implemented.

Solution:

Statement of cost

	Single shift 24,000 units		Double shift 48,000 units	
	Per units (₹)	Total (₹)	Per units (₹)	Total (₹)
Raw materials	6.00	1,44,000	5.40	2,59,200
Wages-variable	3.00	72,000	3.00	1,44,000
Fixed	2.0	48,000	1.00	48,000
Overheads Variable	1.00	24,000	1.00	48,000
Fixed	4.00	96,000	2.00	96,000
Total Cost	16	3,84,000	12.40	5,95,200
Profit	2	48,000	5.60	2,68,000
	18	4,32,000	18.00	8,63,200

Sales in units 2008-09 = Sales/unit selling price

= 4,32,000/18 = 24000 units

Stock of raw materials in units on 31.3.09 = Value of stock/cost/unit

= 36,000/6 = 6000 units

Stock of WIP units on 31.3.09 = Value of WIP/cost/unit

$$= \frac{22,000}{6+5} = \frac{22,000}{11} = 2000 \text{ units}$$

Stock of furnished good in units 2008-09 = Value of stocks/Cost per unit

= 72000/16 = 4500 units

Comparative Statement of working capital requirement

	Single Shift			Double Shift		
	Unit	Rate (₹)	Amount (₹)	Unit	Rate (₹)	Amount (₹)
Current assets						
Inventories						
(*i*) Raw materials	6000	6	36,000	12000	5.40	64,800
(*ii*) WIP	2000	11	22000	2000	9.40	18,800
(*iii*) Finished goods	4500	16	72000	9000	12.40	1,11,600
(*iv*) Sundry Debtors	6000	18	1,08,000	12,000	18.00	2,16,000
Total current assets (A)			2,38,000			4,11,200
Current liabilities						
Creditors for materials	4000	6	24,000	8000	5.40	43,200

for wages	1000	5	5,000	2000	4.00	8,000
For expense	1000	5	5,000	2000	3.00	6,000
Total current liabilities (B)			34,000			57,000
Working Capital (A–B)			2,04,000			3,54,000
(–) Profit included in Debtor	6000	2	12,000	12,000	5.60	67,200
			192,000			2,86,800

Therefore increase in working capital requirement is 2,86,800 – 1,92,000 = 94,800.

Notes:

1. The quantity of materials in process will not change due to double shift working since work started in the 1st shift will be completed in 2nd shift.
2. The valuation of WIP based of prime cost as per the policy of the company is as under:

	Single Shift (₹)	Double Shift (₹)
Materials	6.00	5.40
Wage – Variable	3.00	3.00
Fixed	2.00	1.00
Total	11.00	9.40

2.1.4 On the Basis of Cash Cost

Working capital is the difference between current assets to current liabilities hence while estimating the requirement of working capital it is essential to forecast the amount or cash requirement for each item of current assets and current liabilities.

However, in practice another approach may also be useful in estimating working capital requirements. This approach is based on the fact that in the case of current assets like sundry debtors and finished goods etc. the exact amount of fund blocked is less than the amount of such current assets.

Example: If sundry debtors worth 1 lakh and cost of production is ₹ 75,000 then actual amount of fund blocked with sundry debtors is ₹ 75,000 and the rest ₹ 25,000 is profit.

Again some of the cost items also are non-cash costs as depreciation is a non-cash.

In the above example if the depreciation amount is ₹ 5000 then actual sum of amount blocked is ₹ 70,000.

In other words, it can be said that to finance sundry debtors of ₹ One lakh only ₹ 70,000 is required.

Similarly, in case of finished goods which are valued at cost, non-cash cost may be excluded to work out the amount of fund blocked.

Many experts, therefore calculate the working capital requirements by working out the cash cost of finished goods and sundry debtors.

Notes

Notes:	1. In this approach the debtors are calculated not as a percentage of sales value but as a percentage of cash cost.
	2. Finished goods are valued according to cash cost.

Example: AAR KAY Ltd. sells goods at a gross profit of 25% considering depreciation as part of the cost of production. Its annual figure are as follows:

	₹
Sales to two months credit	18,00,000
Materials consumed (supplier entered 2 months credit)	4,50,000
Wages paid (monthly in arrear)	3,60,000
Manufacturing expenses outstanding at the end of year	40,000
[Cash expenses are paid one month in arrear]	
Total administrative expenses paid as above	1,20,000
Sales promotion expenses, paid quaterly in advance	60,000

The company keeps one month's stock each of raw materials and finished goods and keeps ₹ 1,00,000 in cash.

Assuming a 15% safety margin, ascertain the requirements of working capital of company on cash cost basis. (Ignore work-in-progress).

Solution:

Computation of working capital of AAR KAY Ltd. On cash cost basis

		₹
A.	**Current Assets**	
	Debtors 1/6 of ₹ 14,70,000 (cash cost)*	2,45,000
	Advance payments: sales promotion expense	15,000
	Stock of Raw Material: 4,50,000/12	37,500
	Finished goods: 12,90,000/12**	1,07,500
	Cash in hand	1,00,000
		5,05,000
B.	**Current liabilities**	
	Sundry creditors: 450,000/12 × 2	75,000
	Manufacturing expenses	40,000
	Administrative expenses: 1,20,000/12	10,000
	Wages outstanding: 3,60,000/12	30,000
		1,55,000
	Working capital requirement = A – B	
	(5,05,000 – 1,55,000)	3,50,000
	(+) Add: 15% Safety margin	52,000
	Working capital requirement	4,02,000

Notes

Working Notes:

1. **Computation of amount of depreciations**

	₹	₹
Sales		18,00,000
(–) 25% gross project on sales	4,50,000	
Total manufacturing cost		13,50,000
(–) Materials consumed	4,50,000	
(–) Wages paid	3,60,000	8,10,000
Total manufacturing expenses (*i*)		5,40,000
Cash manufacturing expenses (*ii*) 40000 × 12		4,80,000
Depreciation (*i*) – (*ii*) for the year		60,000

2. **Computation of total cash cost for the year**

Total manufacturing costs	13,50,000
(–) Depreciation	60,000
Cash manufacturing costs	12,90,000**
(+) Administrative expenses	1,20,000
(+) Sales promotion expenses	60,000
Total cash cost for the year	14,70,000*

Example: A company newly commencing business in 2008 has the under mentioned projected P&L a/c

	₹	₹
Sales		21,00,000
(–) Cost of goods sold	15,30,000	
Gross profit		5,70,000
(–) Administrative expenses	1,40,000	
(–) Selling expenses	1,30,000	2,70,000
Profit before tax		3,00,000
(–) Provision for tax		1,00,000
Profit after tax		2,00,000

Cost of goods sold has been calculated as below:

Material used-	8,40,000
Wages and manufacturing expenses	6,25,000
Depreciation	2,35,000
	17,00,000
(–) Stock of finished goods	
(10% of goods produced are yet to be sold)	17,0,000
	15,30,000

The figures given above relate only to finished goods not to work-in-progress. Goods equal to 15% of year's production (in term of physical units)

will be in process on the average requiring full materials but only 40% of the other expenses. The company believes in keeping materials equal to two month's consumption in stock.

All expenses will be paid one month in arrear, suppliers of material will entered 1½ month's credit, sales will be 20% for cash and rest at 2 months credit. 70% of the income tax will be paid in advance in quarterly instalments. The company wishes to keep ₹ 80,000 in cash.

Prepare an estimate of the requirements of working capital on the basis of:

(*i*) Estimates of current assets and current liabilities

(*ii*) Estimates on cash cost basis.

Solution:

(*i*) Estimation of working capital on the basis of current assets and current liabilities.

(*a*) Current assets			₹
Finished goods (10% of goods produced)			
Raw materials		84,000	
Wages		62,500	
Depreciation		23,500	1,70,000
Work-in-progress*			
Materials		1,26,000	
Wages		37,500	
Depreciation		14,100	1,77,600
Raw material**			1,61,000
Sundry debtors***			
Materials		1,00,800	
Wages		75,000	
Depreciation		28,200	
Admin and selling exp.		36,000	
Profit		40,000	2,80,000
Cash in hand			80,000
			8,68,600
(*b*) Current liabilities			
Sundry creditors			
Purchases****			1,40,875
Expenses and wages *****			55,208
Admin and selling expenses******			22,500
Provision for tax			30,000
			2,48,583
Working Capital Required = A – B = (868600-248583)			6,20,017

₹ 6,20,000 are required as working capital.

Notes

(ii) Estimation of working capital on the basis of cash cost

Working capital requirement as per current assets and current liabilities	6,20,017
(–) Profit and depreciation for which funds are not needed *******	1,05,800
Required working capital	5,14,217

₹ 5,14,000 are required as working capital.

Working notes-	₹
* *WIP:* keeping 15% of goods produced	
15% of materials consumed	1,26,000
15% of 40% of wages and expenses	37,500
15% of 40% of depreciation	14,100
	1,77,600

Workings:

** **Raw material:** Raw materials will be 1/6 of total material consumed *i.e.*, ₹ 8,40,000 for finished goods plus 1/6 of ₹ 126,000 for WIP.

*** **Sundry debtors:**

80% of two months sales ₹ 21,00,000 $\times \frac{80}{100} \times \frac{2}{12}$ = ₹ 2,80,000

**** **Creditors:** Creditors of raw material on the basis of total purchases during the year

$$= (8{,}40{,}000 + 1{,}26{,}000 + 1{,}61{,}000) \times 1\frac{1}{2}/12 = ₹\ 1{,}40{,}875$$

***** **Creditors for expenses:**

$$₹\ 6{,}25{,}000 + 37{,}500 \times \frac{1}{2} = ₹\ 55{,}208$$

****** **Creditors for Admin and selling expenses:**

₹ 2,70,000 × 1/12 = ₹ 22,500

******** **Depreciation and project included in the cost of current assets:**

	₹
Finished goods	23,500
WIP	14,100
Debtors	28,200
	65,800
Project included in debtors (including tax *i.e.*, 13,333)	40,000
	105,800

2.2. ISSUES IN WORKING CAPITAL MANAGEMENT

Working capital management refers to the administration of all aspects of current assets, namely cash, marketable securities, debtors and stock *i.e.*,

inventories and current liabilities. The financial manager must determine levels and composition of current assets. He must see that right sources are tapped to finance current assets, and that current liabilities are paid in time.

There are many aspects of working capital management which make it an important function of the finance manager:

1. **Time:** Working capital management requires much of the financial manager's time.
2. **Investment:** Working capital represents a large portion of the total investment in assets.
3. **Criticality:** Working capital management has greater significance for all firms but it is very critical for small firms.
4. **Growth:** The need for working capital is directly related to the firms growth.

Emperical observations show that the financial managers have to spend much of their time to the daily internal operations, relating to current assets and current liabilities of the firm. As the largest portion of the financial managers valuable time is devoted to working capital problems, it is necessary to manage working capital in best possible way to get the maximum benefit.

Investment in current assets represents a very significant portion of the total investment in assets.

The financial manager should pay special attention to the management of current assets on the continuing basis. Action should be taken to curtail unnecessary investment in assets.

Working capital management is critical for all firms but particularly for small firms. A small firm may not have much investment in fixed assets, but it has to invest in current assets.

Notes:
1. Small firms in India face a severe problem of collecting their debtors (book debts or receivables).
2. Role of current liabilities in financing current assets is for more significant in case of small firms, as, unlike large firms, they face difficulties in raising long-term finances.

There is a direct relationship between a firm's growth and its working capital needs. As sales grow, the firm needs to invest more in inventories and debtors. These needs become very frequent and fast when sales grow continuously. The financial manager should be aware of such needs and finance them quickly.

Note: Continuous growth in sales may also require additional investment in fixed assets.

2.2.1 Current Assets to Fixed Asset Ratio

The financial manager should determine the optimum level of current assets so that the wealth of share holders is maximized.

Notes

A firm needs fixed and current assets to support a particular level of output. However, to support the same level of output, the firm can have different levels of current assets.

As the firm's output and sales increases, the need for current assets increases. Generally, current assets do not increase in direct proportion to output, current assets may increase at a decreasing rate with output. The relationship is based upon the notion that it takes a greater proportional investment in current assets when only a few units of output are produced than it does later on when the firm can use its current assets more efficiently.

The level of the current assets can be measured by relating current assets to fixed assets.

CA/FA = Current assets/Fixed assets.

Notes:

1. Assuming a constant level of fixed assets, a higher CA/FA indicates a conservative current assets policy. When other factors be constant.
2. A lower CA/FA indicates an aggressive current assets policy when other factors be constant.
3. A conservative policy implies greater liquidity and lower risk.
4. An aggressive policy impliesh poor liquidity and higher risk.
5. The current assets policy of most of the firms may lie between these two extreme policies.

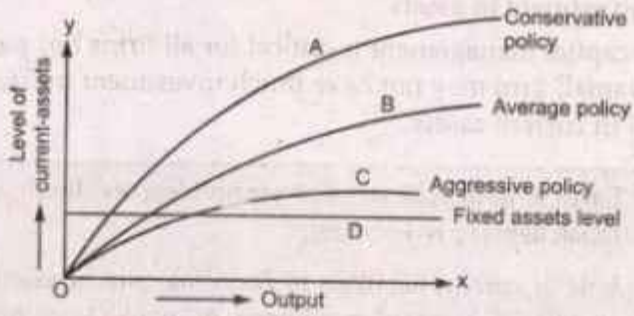


Fig. 2.1

Curve 'D' — Fixed assets level

Alternative curve 'C' — Aggressive policy

Alternative curve 'A' — Conservative policy

Alternative curve 'B' — Average policy

1. At an alternative curve A — CA/FA ratio is high means more liquidity and less risk. CA/FA ratio is greatest at every level of output.
2. At an alternative curve C — CA/FA ratio is low means more risk less liquidity. CA/FA ratio is lowest at every level of output.
3. At an alternative curve B — CA/FA ratio is in between the highest and lowest or moderate means neither high liquidity nor high risk. Hence called as average policy.

Notes

2.2.2 Liquidity Vs Profitability: Risk-Return Trade off

A firm would make first enough investment in current assets if it where possible to estimate working capital needs exactly.

1. Under perfect certainty, current assets holdings would be at the minimum level.
2. A larger investment in current assets under certainty would means a low rate of return on investment for the firm, as excess investment in current assets will not earn enough return.
3. A smaller investment in current assets would mean interrupted production and sales, because of frequent stock-outs and inability to pay to creditors in time due to restrictive policy.

As it is not possible to estimate including needs accurately, the firm must decide about levels of current assets to be carried. Given a firm's technology and production policy, sales and demand conditions, operating efficiency etc., its current assets holdings will depend on its working capital policy.

It may follow a conservative or an aggressive policy. These policies involve risk return trade off.

1. A conservative policy means lower return and risk.
2. An aggressive policy produces higher return and risk.

Hence, there are two important aim/objectives of the working capital management. These are:

(*a*) Profitability

(*b*) Solvancy

Solvancy, used in the technical sense, refers to the firm's continuous ability to meet maturing obligations. Lenders and creditors except prompt settlement of their claims as and when due. To ensure solvancy the firm should be very liquid which means larger current assets holding. If the firm maintains a relatively large investment in current assets, it will have no difficulty in paying claims of creditors when they become due and will be able to fill all sales orders and ensure smooth production. Thus, a liquid firm has less risk of insolvancy. That is, it will hardly experience a cash shortage or a stock-out situation.

However, there is a cost associated with maintaining a sound liquid position. A considerable amount of the firm's funds will be tied up in current assets, and to the extent this investment is idle, the firm's profitability will suffer.

To have high profitability, the firm may sacrifice solvancy and maintain a relatively low level of current assets, but its solvancy would be threatened and would be exposed to greater risk of cash shortage and stockouts.

Example:

Suppose, a firm has the following data for some future year.

	₹
Sales (1,00,000 units)	15,00,000

Notes

EBIT (Earning before interest and tax) 1,50,000

Fixed assets 5,00,000

There are three possibility of current assets holdings, *i.e.*, ₹ 5,00,000, ₹ 4,00,000 and ₹ 3,00,000. Assumed that fixed assets level is constant and profit do not vary with current assets levels. Calculate the effect of alternative working capital policies.

Solution:

	Policies		
	A (₹)	B (₹)	C (₹)
Sales	15,00,000	15,00,000	15,00,000
EBIT	1,50,000	1,50,000	1,50,000
Current assets	5,00,000	4,00,000	3,00,000
Fixed assets	5,00,000	5,00,000	5,00,000
Total assets	10,00,000	9,00,000	8,00,000
Return on total assets (in %) (EBIT/Total assets)	15%	16.67%	18.75%
CA/FA	1.00	0.80	0.60

From the above calculation, it reveals that the alternative A, is most conservative policy, provides greatest liquidity (solvancy) to the firm but at the same time lowest return on total assets.

Alternative C, is most aggressive policy, yields highest return but provides lowest liquidity, thus is very risky to the firm.

Alternative B demonstrates a moderate policy and generates a return higher than alternative A but lower than alternative C and is less risky than alternative C but more risky than alternative A.

2.2.3 Cost Trade-Off

A different way to risk-return trade-off is in terms of the cost of maintaining a particular level of current assets. There are two types of costs associated *i.e.*,

1. Cost of liquidity
2. Cost of illiquidity

If the firm's level of current assets is too high, it has excessive liquidity. It return on assets will be low, as funds tied up in idle cash and stocks earn nothing and high levels of debtors reduce profitability. Thus, the cost of liquidity increase with the level of current assets through low rates of returns.

Cost of liquidity $[C_L] \propto$ Level of current assets $[L_C]$

Cost of liquidity $[C_L] \propto 1/[R_R]$ Rate of returns

The cost of illiquidity is the cost of holding insufficient current assets. The firm will not be in a position to honour its obligations, if it carries too

little cash. This may force the firm to borrow at high rate of interest. This will also adversely affect the credit-worthiness of the firm and it will face difficulties in obtaining funds in future. All this lead to insolvancy of the firm.

Similarly, low level of stocks will result in loss of sales, as customers will shift to competitors. There will be low level of debtors due to light credit policy which will further impair sales. Thus, the low level of current assets involve costs which increases as this level falls.

In determining the optimum level of current assets, the firm should balance the profitability solvancy tangle by minimizing total cost—cost of liquidity and cost of illiquidity.

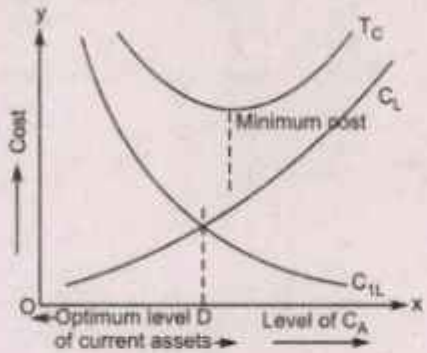


Fig. 2.2

Above figure illustrates:

1. Level of current assets and cost of liquidity increases while cost of it illiquidity decreases and

$$L_C \propto C_L$$
$$L_C \propto 1/C_{LI}$$
$$C_L \propto 1/C_{LI}$$

The firm should maintain its current assets at that level where the sum of these two costs *i.e.*, total cost is minimized. The minimum cost point indicates the optimum level of current assets.

2.3. ESTIMATING WORKING CAPITAL NEEDS

There are many methods in the determination of working capital needs. These are as below (which are practically in use).

(*a*) Current assets holding period.

(*b*) Ratio of sales.

(*c*) Ratio of fixed investment.

2.3.1 Current Assets Holding Period

To estimate working capital requirements on the basis of average holding period of current assets and relating them to cost based on the firm's experience in the previous years. This method is essentially based on the operating cycle concept.

Notes

2.3.2 Ratio of Sales

To estimate working capital requirements, as a ratio of sales on the assumption that current assets change with rules.

2.3.3 Ratio of Fixed Investment

To estimate working capital requirements as a percentage of fixed investment.

Example: There are following two firms A and B. The detail information of each firm is as below.

	Firms	
	A (₹)	B (₹)
Material cost		
Raw material consumed	2,48,000	2,48,000
(–) By product	68,000	68,000
Net material cost 'A'	1,79,200	1,79,200
Manufacturing cost		
Labour	1,71,200	1,71,200
Maintenance	1,60,000	1,60,000
Power and fuel	57,600	57,600
Factory overheads	2,40,000	2,40,000
Depreciation 'G'	1,60,000	3,20,000
Total manufacturing cost 'B'	7,88,800	9,48,800
Total product cost (A + B) = C	9,68,000	11,28,000
Annual sales 'D'	14,48,000	14,48,000
PBIT (D – C) = E	4,80,000	3,20,000
Investment 'F'	16,00,000	32,00,000
Period	One year	One year
Plant life	10 years	10 years
PBDIT	6,40,000	6,40,000
ROI (PBIT/investment–Dep)	33.3%	11.1%

Calculate the requirement/estimating working capital with the help of (*i*) Current assets holding period, (*ii*) Ratio of sales, (*iii*) Ratio of fixed investment, on the basis of following assumptions.

(*a*) Method (*i*) inventory - one month's supply of each of raw material, semifinished goods and finished material.

Debtor - One month's sales

Operating cash - One month's total cost

(*b*) Method (*ii*) 25-35% of annual sales

(*c*) Method (*iii*) 10-20% of fixed capital investment.

Solution. For firm 'A'

(*i*) Method (Current assets holding period)

Inventory requirements

(*a*) Raw material = One month's supply
= 2,48,000/12 = ₹ 20,667

(*b*) Semi-finished material = One month's supply based on raw material + $\frac{1}{2}$ (normal conversion cost)
= 20,667 + (1,71,200 + 1,60,000 + 57,600) × $\frac{1}{2}$ 1/12
= 20,667 + 16,200 = ₹ 36,867

(*c*) Finished materials = One month's supply
= 9,68,000/12 = ₹ 80,666

Hence total inventory needs = 20,667 + 36,867 + 80,666
= ₹ 1,38,200

Debtors = One month's sales
= 14,48,000/12 = ₹ 1,20,667

Operating cash = One month's total cost
= 9,68,000/12 = ₹ 80,667

Now total working capital requirement is
= ₹ 1,38,200 + 1,20,667 + 80,666
= ₹ 3,39,533

(*ii*) Method (Ratio of sales)

Average ratio of sales is 30%

Annual sale = 14,48,000

Therefore 30% of annual sales = $\frac{30}{100}$ × 14,48,000
= ₹ 4,34,400

(*iii*) Method (Ratio of fixed investment)

Average rate of fixed investment = 15%

Total fixed investment = ₹ 16,00,000

Then, 15% of 16,00,000 = $\frac{15}{100}$ × 16,00,000
= ₹ 2,40,000

Rate of return = PBIT/Net fixed investment + Working capital

Notes

Notes

Working capital for firm A = ₹ 3,39,533

Because working capital estimated in (*ii*) method *i.e.*, Ratio of sales is ₹ 4,34,400 and in III method *i.e.*, Ratio of fixed investment is ₹ 2,40,000.

₹ 3,39,533 lies between ₹ 4,34,400 and ₹ 2,40,000. 1st method *i.e.*, Current assets holding period is moderate.

Notes: 1. 2nd method is conservative.
2. 3rd method is aggressive.

$$\text{Rate of return} = \frac{4,80,000}{[(16,00,000 - 1,60,000) + 3,39,533]}$$

$$= \frac{4,80,000}{(14,40,000) + 3,39,533}$$

$$= 4,80,000/\ 17,79,533 = 0.2697$$

$$\simeq 0.27 = 27\%$$

For firm B – By 1st method (current assets holding period)

Raw material = One month's supply

= 2,48,000/12 = ₹ 20,667

Semi-finished material = One month's supply based on raw material + 1/2 of normal conversion cost

$$= 20,667 + (1,71,200 + 1,60,000 + 57,600) \times \frac{1}{2}/12$$

= 20,667 + 16,200 = ₹ 36,867

Finished material = One month's supply

= 9,68,000/12 = ₹ 80,666

Total inventory needs are = 20,667 + 36,867 + 80,666 = ₹ 1,38,200

Debtors = One month's sales

= 14,48,000/12 = ₹ 1,20,667

Operating cash = One month's total cost

= 11,28,000/12 = ₹ 94,000

Thus, total working capital required = 1,38,200 + 94,000 + 1,20,667

= ₹ 3,52,867

2nd method – (Ratio of sales) = 30% of 14,48,000 = ₹ 4,34,400

3rd method (Ratio of fixed assets) = 15% of 32,00,000 = ₹ 4,80,000

In this case 2nd method gives more moderate working capital policy, because it lies between 4,80,000 and ₹ 3,52,867.

To compare both the firm each has to brought to same level. Hence and in both firms 1st method is used. Therefore in this problem specially 1st method *i.e.*, current assets holding period is considered.

Note: Through current assets holding period gives details of working capital items but it is subjected to error if markets are seasonal or in other words where markets are seasonal this method is not applicable.

Rate of return = PBIT/Net fixed investment + Working capital

= 3,20,000/[32,00,000 + 3,20,000 + 3,52,867]

$$= \frac{3,20,000}{38,72,867} = 0.0826$$

= 0.083 = 8%

ROI given

A firm = 33.3% which is dropped to 27%

B firm = 11.1% which is dropped to 8%

Hence, apart from above given factors certain more factors are to be considered while making choice of the method of estimating working capital such as seasonal variations in operations, accuracy in sales forecasts, investment cost and variability in sales prices. Production cycle, credit and collection policy of the firm would have an impact on requirement of working capital requirements. Therefore these are to given due weightage in projecting working capital requirement.

2.4. OPTIMUM WORKING CAPITAL

Current ratio along with acid test ratio has traditionally been considered the best indicators of the working capital situation. It has been stated by many accountants that a current ratio of 2 (two) for a manufacturing firm implies that the firm has an optimum amount of working capital. Thus, if the current assets (CA) are twice the amount of current liabilities (CL), a manufacturing concern is supposed to be having an adequate amount of working capital. This is supplemented by Acid Test Ratio which is suppose to be 1 (one) means liquid current assets are equal to current liabilities.

Note: Bankers, financial institutions, financial analysts, investors and other people interested in financial statements have for years, considered. The current ratio at '2' and acid test ratio at '1' as indicators of a good working capital situations.

As a thumb rule, this may be quite adequate. However, it cannot be over emphasised that optimum working capital can be determined only with reference to the particular circumstances of a specific situation. Thus, in a company where the inventories are easily saleable and the sundry debtors are as good as liquid cash, the current ratio may be lower than '2' and yet firm may be sound.

An optimum working capital ratio is dependent upon the business situation as such and the nature and composition of various current assets. A company having short conservation cycle (from cash to cash) may have lower current ratio. Thus, in the case of Vanaspati manufacturing company, enjoying high reputation and credit terms in the market, a current ratio of 1.6 has been serving as ideal. This is because the firm with its reputation can buy oil and other supplies on credit. The production period of Vanaspati is short and the demand position is such that immediate cash in realisable against sale of Vanaspati. Therefore it is not essential for this company to maintain high current ratio. Its inventories are low and its debtors are also low. On the other hand, creditors are high. Its acid test ratio is 0.8 and the current ratio is 1.6 both of these reflect a sound working capital position.

In the case of company engaged in manufacturing heavy electrical equipments and machinery, it takes long time to assemble one piece of machinery. It has to carry large inventories. It customers being mostly Govt. department, it cannot realise it dues quickly then in this case the requirement of working capital is high. Company may have to maintain a current ratio more than '3'. It does not mean that it has idle funds. It is very important, therefore, to work out the requirements of working capital specifically in a given situation.

2.5. FACTORS TO BE TAKEN INTO CONSIDERATION WHILE DETERMINING THE REQUIREMENT OF WORKING CAPITAL

Following are the important factors in the determination of the working capital requirements,

(*a*) Production policies
(*b*) Nature of the business
(*c*) Credit policy
(*d*) Inventory policy
(*e*) Abnormal factors
(*f*) Market conditions
(*g*) Conditions of supply
(*h*) Business cycle
(*i*) Growth and expansion
(*j*) Level of taxes
(*k*) Dividend policy
(*l*) Price level changes
(*m*) Operating efficiency

2.5.1 Production Policies

A sugar factory which belongs to a seasonal industry would obviously have its working capital needs affected by the length of the crushing season.

The production schedule, *i.e.*, the plan for production, has great influence on the level of inventories. In some cases raw materials can be procured only in a particular season and have to be stocked for the production of the whole year. In many others, the production cycle is limited to a part of the year and raw materials have to be accumulated throughout the year. In all such cases the need for working capital will vary according to the production plans.

Similarly, the decisions of the management regarding automation etc. also affect working capital requirements.

Notes:
1. In a labour intensive process, the requirements of working capital will be higher.
2. In the case of highly automatic plants the requirements of long-term funds would be greater.

2.5.2 Nature of Business

The shorter the manufacturing process, the lower is the requirements of the working capital.

Time of Manufacturing Process × Working Capital.

This is because, in such a case, inventories have to be maintained at a low level. Longer the manufacturing process the higher would be the requirements of working capital.

This is the reason why highly capital intensive industries require a large amount of working capital to run their sophisticated and long production process. Similarly, a trading concern requires lower working capital than a manufacturing concern.

2.5.3 Credit Policy

The credit policy of the company also determines the requirements of working capital. This is because, in such a case, inventories have to be maintained at a high level. A company which allows liberal credit to its customers may have higher sales but consequently will have large amount of funds tied up in sundry debtors.

Similarly, a company which has a very efficient debt collection machinery and offens strict credit terms, may require lesser amount of working capital than the one where debt collection system is not so efficient or where the credit terms are liberal.

Tight credit policy — Lower working capital requirements

Liberal credit policy — More working capital requirements

The credibility of a company in a market also has an impact on the working capital requirements. Reputed and established concerns can purchase raw materials on credit and enjoy many other services also like door delivery, after sales services etc. This would mean that they can easily have large current liabilities therefore the required working capital may not be very high.

Notes

2.5.4 Inventory Policy

Inventory policy of a company also an impact on the working capital requirements since a large amount of funds is normally locked up in inventories. An efficient firm may stock raw material for a smaller period and may therefore require lesser amount of working capital.

2.5.5 Abnormal Factors

Abnormal factors like strikes and lockouts also require additional working capital. Recessionary conditions necessitate a higher amount of stock of finished goods remaining in stock. Similarly inflationary conditions necessitate more funds for working capital to maintain the same amount of current assets.

2.5.6 Market Conditions

Working capital requirements are also affected by market conditions like degree of competition. Large inventory is essential as delivery has to be off the shelf or credit has to be extended on liberal terms when market competition is fierce or market is not very strong or is a buyer's market.

2.5.7 Conditions of Supply

If prompt and adequate supply of raw materials, spares, stores etc. is available it is possible to manage with small investment in inventory or work on Just-In-Time (JIT) inventory principles. However if supply is erratic, scant, seasonal, channelised through government agencies etc., it is essential to keep larger stocks increasing working capital requirements.

2.5.8 Business Cycle

Business fluctuations leads to cyclical and seasonal changes in production and sales and effect the working capital requirements.

2.5.9 Growth and Expansion

The growth in volume and growth in working capital go hand in hand. However, the change may not be proportionate and the increased needs for working capital is felt right from the initial stages of growth.

2.5.10 Level of Taxes

The amount of taxes depends upon taxation laws. These amounts usually have to be paid in advance. Thus, need for working capital varies with tax rates and advance tax provisions.

2.5.11 Dividend Policy

Payment of dividend utilises cash while retain earnings/profits act as a source of working capital. Thus, working capital gets affected by dividend policies.

2.5.12 Price Level Changes

Inflationary trends in the economy necessitate more working capital to maintain the same level of activity.

2.5.13 Operating Efficiency

Efficient and co-ordinated utilization of capital reduces the amount required to be invested in working capital.

Notes

2.6. WORKING CAPITAL MANAGEMENT POLICIES

Working capital management polices have a great effect on the firms profitability, liquidity and its structural health. Gross working capital consists of cash, receivables and inventories. If a firm has relatively high investment in these assets in comparison to a firm which is transacting the same volume of sale, it will have lower profitability in comparison to the latter.

Therefore, a firm which has high working capital turnover will have higher profitability.

Working capital turnover $\propto$ Profitability

This may require the reduction of investment in working capital but, if it is reduced disproportionally. It will affect the liquidity of the firm.

Generally, the current ratio and the quick ratio indicate liquidity aspect of a firm. If current assets are reduced beyond a limit, the current and quick ratios will be adversely affected leading the firm to poor liquidity.

Therefore, it is essential that finance manager lays down such working capital management policies that a proper balance is stuck between profitability and liquidity. As pofitability and liquidity are inversely related. When one increases other decreases.

Working capital management policies also have a great impact on the structural health of the organization. If different components of working capital are not properly balanced, then in spite of the fact that current ratio and quick ratios may indicate satisfactory financial position in respect to the liquidity of the firm, it may not in fact be as liquid as indicated by the current and quick ratios.

For example:

If the proportion of inventory is very high in the total current assets or greater proportion is appropriated by slow moving or absolute inventory, then this cannot provide the cushion of liquidity.

Similarly, high investments in debtors and failure of the firm to collect them in time will also adversely affect the real liquidity of the firm, thereby adversely affecting the structural health of the organization.

If a firm carries higher cash and bank balances, it would mean that the firm is not making profitable use of its resources. Idle cash does not give any return to the firm but it has carrying cost.

Notes

It is therefore, important that the finance manager should chalk out such working capital management policies in respect of different components of working capital *i.e.*, cash, receivables, inventories, debtors etc. to ensure higher profitability, proper liquidity and structural health of the organization. A proper and efficient management of working capital can ensure all above.

Apart from the profitability—risk trade off, another important ingredient of the theory of working capital management is determining the financing mix.

One of the most important decisions, in other words, involved in management of croching capital is how current assets will be financed. There are broadly speaking two sources from which funds can be raised for current assets financing.

1. Short-term sources *i.e.*, current liabilities.
2. Long-term sources such as share capital, long-term borrowings, internally generated resources like retained earnings and so on.

What proportion of current assets should be financed by current liabilities and how much by long-term resources, will determine the financing mix.

There are three basic approaches to determine an appropriate financing mix.

1. Hedging approach
2. Conservative approach
3. Trade-off between these two.

Hedging Approach

It is also called as matching approach. The term hedging is often used in the sense of a risk-reducing investment strategy involving transactions of a simultaneous but opposing nature so that the effect of one is likely to counter balance the effect of the other. With reference to an appropriate financing mix, the terms hedging can be said to refer to the process of matching of debt with the maturities of financial need. This approach to the financing decision to determine an appropriate financing fix is therefore a matching approach.

According to this approach, the maturity of the source of funds should match the nature of the assets to be financed. For this purpose of analysis, the current assets to be financed into following two classes:

(*i*) Those which are required in a certain amount for a given level of operations and hence, do not vary overtime.

(*ii*) Those which fluctuate overtime.

This approach suggests that long-term funds should be used to finance the fixed portion of current assets requirement as spelt out in above (*i*) class, in a manner similar to the financing of fixed assets.

The purely temporary requirements that is the seasonal variations over and above the permanent financing needs should be appropriately financed with short-term funds *i.e.*, current liabilities.

This approach therefore divides the requirements to total funds into permanent and seasonal components, each being financial by a different service.

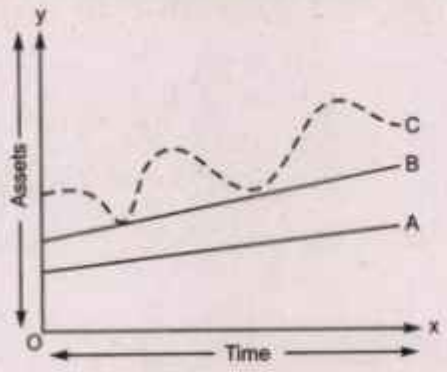
Example: Estimated total fund requirement of ABC Ltd.

Month	Total fund required	Permanent requirements (₹)	Seasonal requirement (₹)
(1)	(2)	(3)	(4)
January	8,500	6900	1600
February	8,000	6900	1100
March	7,500	6900	600
April	7000	6900	100
May	6900	6900	0
June	7150	6900	250
July	8000	6900	1100
August	8350	6900	1450
September	8500	6900	1600
October	9000	6900	2100
November	8000	6900	1100
December	7500	6900	600
			Total 11600

In the above e.g., total fund requirement in ₹ is given in col (2). Permanent fund requirement in ₹ in col (3) which should be financed with long-term funds and the seasonal portion in ₹ is given in col (4). Which should be financed with short-term funds *i.e.*, current liabilities.

Means current assets would be equal to the short-term financing available *i.e.*, current liabilities.

Note: There would be no Net working capital (NWC).



A = Fixed assets
B = Fixed or permanent current assets
C = Temporary current assets

Fig. 2.3

Notes: 1. A and B are financed by long-term financing.
2. C are financed by short-term financing.

Notes

Conservative Approach

This approach suggests that the estimated requirement by total funds should be met from long-term sources, the use of short-term funds should be restricted to only emergency situation or when there is an unexpected outflow of funds. In other words, under this approach a firm finances its permanent assets and also a part of temporary current assets with long-term financing. If relies heavily on long-term financing and is less risky so far as solvency is concerned, however the funds may be invested in such investment which fetch small returns to build up liquidity. Thus deviously affecting profitability.

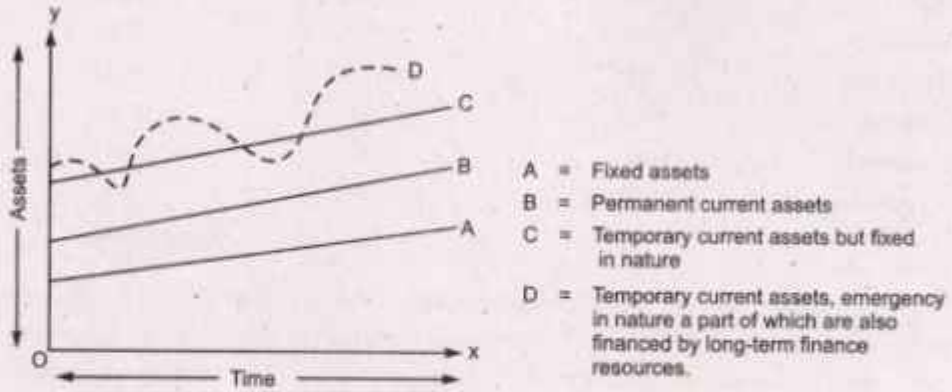


Fig. 2.4

Aggressive Approach

The firm uses more short-term financing than is justified in this approach. The firm finances a part of its permanent current assets with short-term financing. This is more risky but may add to the return on assets.

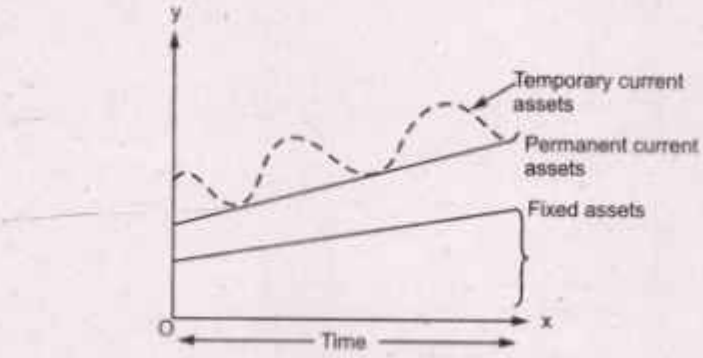


Fig. 2.5

Comparison of Hedging Approach with Conservative Approach

The comparison of these two approaches can be done on the basis of following two attributes:

(a) Cost consideration

(b) Risk consideration

Notes

Cost Consideration

The cost of these financing plans has a bearing on the profitability of the enterprise. If in the previous example, the cost of short-term funds and long-term funds be 3% and 8% respectively. Then

Cost of financing under hedging plan can be estimated as:

(i) **Cost of short-term funds:** The cost of short-term funds is equal to average annual short-term loan × interest rate.

Cost of short-term funds = average annual short-term loan × interest rate

$$\text{Average annual short-term loan} = \frac{\text{total of monthly seasonal requirements}}{\text{number of months}}$$

Average annual short-term loan = 11,600/12 = ₹ 966.66

Short-term cost = 966.67 × 0.03 = ₹ 29

(ii) **Cost of long-term funds:** It is equal to average annual long-term funds requirements × annual interest rate

= 6,900 × 0.08 = ₹ 552

(iii) Total cost under hedging plan = total of (i) + (ii)

= 29 + 552 = ₹ 581

Conservative plan: The cost of financing under the conservative plan is equal to the cost of long-term funds that is annual average loan multiplied by long-term rate of interest

= 900 × 0.08 = ₹ 720

Thus, the cost of financing under the conservative plan is ₹ 720, which is higher than the cost using the hedging approach *i.e.*, ₹ 581.

Note: The conservative plan for financing is more expensive because the available funds are not fully utilised during certain period. Moreover, interest has to be paid for funds which are not actually needed.

Risk Consideration

Hedging approach: The hedging approach is more risky in comparison to the conservative approach. There are two reasons for this,

(i) There is an already observed, no NWC with hedging approach because no long-term funds are used to finance short-term seasonal needs that is current assets are just equal to current liabilities.

(ii) The hedging plan is risky because it involves at most full utilization of the capacity to use short-term funds and in emergency situations it may be difficult to satisfy the short-term needs.

Notes

Conservative approach: With the conservative approach in contrast the company does not use any of its short-term borrowings. Therefore, the firm has sufficient short-term borrowing capacity and avoid technical insolvency.

Notes:
1. Hedging approach is a high profit, low cost–high risk, no NWC approach to determine an appropriate financing mix.
2. Conservative approach is low profit, high cost–low risk, high NWC approach.

Trade-off between hedging and conservative approaches: Hedging approach is associated with high profit as well as high risk while the conservative approach provides low profit and low risk. Obviously, neither approach by itself would serve the purpose of efficient working capital management.

A trade-off between two extremes would give an acceptable financing strategy and provides a financing plan that lies between these two extremes.

The exact trade-off between risk and profitability will differ from case to case depending on risk perception of the decision makers.

One possible trade-off could be assumed to be equal to the average of the minimum and maximum monthly requirements of funds during a given period of time. This level of requirement of funds may be financed through long-term services and for any additional financing need, short-term funds may be used.

Trade-off between hedging and conservative approaches in ABC Ltd.

Month	Total fund required (₹)	Permanent requirements (₹)	Seasonal requirement (₹)
(1)	(2)	(3)	(4)
January	8,500	7950	550
February	8,000	7950	50
March	7,500	7950	0
April	7000	7950	0
May	6900	7950	0
June	7150	7950	0
July	8000	7950	50
August	8350	7950	400
September	8500	7950	550
October	9000	7950	1050
November	8000	7950	50
December	7500	7950	0
			Total 2700

*Maximum fund requirement = 9000 in October

Minimum funds requirement = 6900 in May

Average = 9000 + 6900/2 = ₹ 7950

In other words the company should use ₹ 7950 each month in the form of long-term funds and raise additional funds, if needed, through short-term resources *i.e.*, current liabilities. The above table reveals that:

(*i*) No short-term funds are required during 5 months *i.e.*, March, April, May, June and December because long-term funds available exceed the total requirements for funds.

(*ii*) In the remaining 7 months the company will have to use short-term funds amounting to ₹ 2700.

Cost of financing plan under trade-off approach

(*i*) Cost of short-term funds = average annual short-term funds required × rate of short-term interim = 2700/12 × 0.03 = ₹ 6.75

(*ii*) Cost of long-term funds = 7950 × 0.08
= ₹ 636.

(*iii*) Total cost of trade-off plan = ₹ 6.67 + ₹ 636
= ₹ 642.75

Risk consideration = 7950 – 6900 = ₹ 1050

Means NWC under this plan would be ₹ 1050.

2.7. ILLUSTRATIONS

1. XYZ Ltd. desires to purchase a business and has consulted you. He needs an advise from you on the amount of working capital requirements in the 1st year of operations on the basis of following estimates add 10% to your figures to meet the contingencies.
   (*a*) Stock of finished goods – ₹ 5,000
   (*b*) Stock of stores and materials – ₹ 8,000
   (*c*) Average credit inland – 6 weeks after sales
   (*d*) Average credit inland amount – ₹ 3,12,000
   (*e*) Average credit export – 1.5 weeks
   (*f*) Average credit export amount – ₹ 78000
   (*g*) Time lag in wages – 1.5 weeks
   (*h*) Amount of wages – ₹ 2,60,000
   (*i*) Time lag in stock and materials – 1.5 months
   (*j*) Amount of stock and materials – ₹ 48,000
   (*k*) Time lag in rent and royalties – 1.5 months
   (*l*) Amount of rent and royalties 10,000
   (*m*) Time lag in salary of clerical staff – 0.5 months
   (*n*) Amount of salary of clerical staff – ₹ 62,400

Notes

Notes

(o) Time lag in managerial salary – 0.5 month

(p) Amount of salary in managerial level – ₹ 4,800

(q) Misc. Expenses time lag – 1.5 months

(r) Amount of misc. expenses – ₹ 48,000

(s) Payments made in advance –

(i) Sundry expenses (paid quaterly) – ₹ 8,000

(ii) Undrawn profit on an average throughout the year – ₹ 11,000

Solution:

Statement to determine Net working capital for XYZ Ltd.

(a) Current assets

	₹
(i) Stock of financial goods	5,000
(ii) Stock of stores and materials	8,000
(iii) Debtors	
Inland sales (3,12,000 × 6/52)	36,000
Export sales (78,000 × 3/104)	2,250
(iv) Advance payment sundry expenses (8000 × 1/4)	2,000
Total investments in current assets	53,250
(b) Current liabilities	
(i) Wages (2,60,000 × 3/104)	7,500
(ii) Stock/materials (48,000 × 3/24)	6,000
(iii) Rent and Royalties (10,000 × 6/12)	5,000
(iv) Clerical staff (62,400 × 1/24)	2,600
(v) Manager (4,800 × 1/24)	200
(vi) Misc. expenses (48,000 × 3/24)	6,000
Total estimation current liabilities	27,300
(c) Net working capital	
(i) Current assets - Current liabilities (A – B)	25,950
(ii) Add 10% towards contingencies	2,595
Average amount of working capital required	28,545

Assumptions

(a) 52 weeks are assumed in a year

(b) Undrawn profit has been ignore due to–

(i) For the purpose of determining working capital provided by the Net Profit. It is necessary to adjust the net profit for income tax and dividends/drawings etc.

(ii) Profit need not always be a source of financing working capital. It may be used for other purposes like purchase of fixed assets.

Repayment of long-term loans and so on. Since the firm does not seem to have such uses, ₹ 11,000 may be treated as source of working capital. But with this working capital will not change.

(*c*) Actual working capital requirement would be more than what is estimated here as the cash component of the current assets is not considered.

2. A performa cost sheet of a company provides the following informations.

(*i*) Raw materials	Amount/unit in ₹ 80
(*ii*) Direct labour	₹ 30
(*iii*) Overhead	60
Total cost	170
Profit	30
Selling price	200

Further particulars are as below:

(*a*) Raw material in stock, on average, one month

(*b*) Materials in process (completion stage) 50% on average half a month

(*c*) Finished good in stock an average one month

(*d*) Credit allowed by suppliers in one month

(*e*) Credit allowed to debtors in two months

(*f*) Average time lag in payment of wages is 1.5 weeks

(*g*) Average time lag in payment of overhead expenses – one month

(*h*) Cash sale is ¼th of output.

(*i*) Cash-in-hand and bank is desired – ₹ 3,65,000

Prepare statement sharing the working capital needed to finance a level of activity of 1,04,000 units of production.

Assume

(1) production is evenly throughout the year

(2) wages and overheads occur similarly

(3) 4 Weeks = one month

Solution:

Determination of Working Capital

(*a*) Current assets

	₹
(*i*) Stock of materials for 1 month = (1,04,000 × 80 × 4/52)	6,40,000
(*ii*) Work-in-progress for 0.5 month	
(*a*) Material (1,04,000 × 80 × 2/52) × .5	1,60,000
(*b*) Labour (1,04,000 × 30 × 2/52) × .5	60,000
(*c*) Overheads (1,04,000 × 60 × 2/52) × .5	1,20,000

Notes

(iii)	Finished goods for one month (1,04,000 × 170 × 4/52)	13,60,000
(iv)	Debtors of 2 months (78,000 × 170 × 8/52)	20,40,000
(v)	Cash in hand and bank	3,65,000
	Total investment in current Account	47,45,000

(b) Current liabilities

(i)	Creditors 1 month's purchase of raw material (1,04,000 × 80 × 4/52)	6,40,000
(ii)	Average time lag in payment of expenses	
(a)	Overheads – (1,04,000 × 60 × 4/52)	4,80,000
(b)	Labour – (1,04,000 × 30 × 3/104)	90,000
	Total estimate current	12,10,000

(c) Net working capital = CA – CL
= 47,45,000 – 12,10,000
= ₹ 35,35,000

Assumptions

(a) 26,000 units have been sold for cash, therefore credit sales is only for 78,000 units

(b) A year has 52 weeks

(c) All overheads are variable. If depreciation on overheads is considered the requirement of working capital will decrease.

3. While preparing a project report on behalf of a client following parts are collected. Estimate the net working capital required on the basis of following.

Particulars	Amount/unit
Estimated cost of productions	
Raw material	₹ 160
Direct labour	₹ 60
Overheads (exclusive of depreciation)	₹ 120
Total cash cost	₹ 340

Additional informations:

(a) Description – ₹ 20/unit

(b) Selling price – ₹ 400/unit

(c) level of activity – 2,08,000 units/annum

(d) Raw material in stock – average 8 weeks

(e) Work-in-progress

(i) 50% completion stage in respect of conversion cost

(ii) 100% completion in respect of materials – average 4 weeks

(f) Finished goods in stock – average 8 weeks

(g) Credit allowed by supplier – average 8 weeks

(*h*) Credit allowed to debtors – average 8 weeks

(*i*) Large in payment of wages – average 15 weeks

(*j*) Cash and bank are expected to 25,000

Assumptions

(*i*) production is evenly

(*ii*) there are 52 weeks/year

(*iii*) Wages and overheads occur evenly

(*iv*) All sales are in credit

Solution.

Net Working Capital estimation of the project

	₹
(*a*) Current Assets	
(*i*) Raw materials stock (2,08,000 × 160 × 8/52)	51,20,000
(*ii*) Work-in-progress	
(*a*) Raw material (2,08,000 × 160 × 4/52)	25,60,000
(*b*) Direct labour (2,08,000 × 60 × ½ × 4/52)	4,80,000
(*c*) Overheads (2,08,000 × 120 × ½ × 4/52)	9,60,000
(*iii*) Finished goods stock – (2,08,000 × 340 × 8/52)	1,08,80,000
(*iv*) Debtors (2,08,000 × 340 × 8/52)	1,08,80,000
(*v*) Cash and bank	25,000
Total investment in current assets	3,09,05,000
(*b*) Current liabilities	
Creditors (2,08,000 × 160 × 8/52)	51,20,000
Lag in payment of wages (2,08,000 × 60 × 3/104)	3,60,000
Total current liabilities	8,72,000
Net Working Capital (A – B)	3,00,33,000
Add 10%	30,03,300
	3,30,36,300

Notes:

1. A full unit of raw material is required at the beginning of the manufacturing process and therefore total cost of the material *i.e.*, 160 Rs/unit is considered.
2. In the case of expenses *i.e.*, direct labour and overheads the unit has been finished only to the extent of 50%, accordingly only these are valued.

4. From the following projections you are required to determine working capital requirements:

(*a*) Annual sales ₹ 14,40,000

(*b*) Cost of production (including depreciation 1,20,000) – ₹ 12,00,000

Notes

(c) Raw material purchased – ₹ 7,05,000
(d) Monthly expenditure – ₹ 30,000
(e) Estimated opening stock of raw materials – ₹ 1,40,000
(f) Estimated closing stock of raw materials – ₹ 1,25,000
(g) Inventory
  (i) Raw material – 2 months
  (ii) Work-in-progress – ½ month
  (iii) Finished goods – 1 month
(h) The credit extended to one month
(i) On sales orders the company receives an advance of ₹ 15,000
(j) Production is even throughout the year
(k) Cash ₹ 35,000

Solution:

Determination of Net Working Capital

			₹
(a)	**Current assets**		
	Cash balance		35,000
	Inventory		
	Raw material opening stock	1,40,000	
	(+) Purchases	7,05,000	
	(–) Closing Stock	1,25,000	
	Annual consumption	7,20,000	
	Two months requirement 720,000 × 2/12		1,20,000
	Work-in-progress – 10,80,000 × 1/24		45,000
	Finished goods – 10,80,000 × 1/12		90,000
	Debtors 10,80,000 × 1/2		90,000
	(When there is no opening stock and no closing stock of finished goods)		
	Total current assets		3,80,000
(b)	**Current liabilities**		
	Trade creditors – 7,05,000 × 1/24		29,375
	Advance received from debtors		15,000
	Total current liabilities		44,375
	Net working capital (A – B)		3,35,625

5. From the following data, compute the duration of the operating cycle for each of two years and comment on the increase/decrease.

Particulars	Year 1 (₹)	Year 2 (₹)
Stock:		
Raw materials	20,000	27,000
WIP	14,000	18,000
Finished goods	21,000	24,000

Purchase of raw materials	96,000	1,35,000
Cost of goods sold	1,40,000	1,80,000
Sales	1,60,000	2,00,000
Debtors	32,000	50,000
Creditors	16,000	18,000

It is assumed there are 360 days in a year.

Solution:

Particulars	Year 1 (days)	Year 2 (days)
1. Raw materials holding period		
$\left(\frac{360 \times \text{stock of raw material}}{\text{Cost of material consumed}}\right)$	$\left(\frac{360 \times 20,000}{96,000}\right) = 75$	$\left(\frac{360 \times 27,000}{1,35,000}\right) = 72$
2. Less (–) creditors payment period		
(360 × creditors/purchases)	$\left(\frac{360 \times 16,000}{96,000}\right) = 60$	$\left(\frac{360 \times 18,000}{1,35,000}\right) = 48$
3. Work-in-progress holding period		
(360 × stock of WIP/Cost of good manufactured)	$\left(\frac{360 \times 14,000}{1,40,000}\right) = 36$	$\left(\frac{36 \times 18,000}{1,80,000}\right) = 36$
4. Finished goods holding period		
$\left(\frac{360 \times \text{stock of finished goods}}{\text{Cost of goods sold}}\right)$	$\left(\frac{360 \times 21,000}{1,40,000}\right) = 54$	$\left(\frac{360 \times 24,000}{1,80,000}\right) = 48$
5. Debtors collection period		
(360 × debtors/credit sales)	$\left(\frac{360 \times 32,000}{1,60,000}\right) = 72$	$\left(\frac{360 \times 50,000}{2,00,000}\right) = 90$
Duration of operating cycles = (1 + 5)	= 177	= 198

Assumptions

1. Raw material consumption is equal to the purchases.
2. Cost of goods manufactures is equal to the cost of goods sold.
3. Debtors is equal to total sales means sales are only in credit.

Interpretation

1. In the 1st year the operating cycle was of 177 days where as in the 2nd year the operating cycle has increased upto the extent of 198 days.
2. On the comparations of the different factors of operating cycle of both years. It is found
   (*a*) Raw material holding period in the 2nd year is decreased from 75 to 72 days. (W.C. requirement is less)

Notes

(b) Creditors payment period has also decreased from 60 days to 48 days. (W.C. requirement is more).

(c) WIP holding period remains unchanged.

(d) Finished goods holding period has also decreased from 54 to 48 days (W.C. requirement is less).

(e) Debtors collection period has increased from 72 days to 90 days (W.C. requirement has increased).

Result

In the 2nd year as compared with 1st year the requirement of working capital has increased due to main increase in the debtors collection period and decrease in the creditors payment period.

6. On the basis of the following information of ABC Ltd. You are required to ascertain the requirement of working capital, when there is a regular production and sales cycle and wages, overheads accure evenly. Wages are paid in the next month of accural. Material is introduced in the beginning of the production cycle).

(a) Production of the year – 69,000 units

(b) Finished goods holding period – 3 months

(c) Raw material holding period – 2 months

(d) Production process – 1 month

(e) Credit allowed by creditors – 2 months

(f) Debtors collection period – 3 months

(g) Selling price/unit – ₹ 50

(h) Raw material

(i) Cost of raw materials – 50% of selling price.

(j) Cost of direct wages –10% of selling price.

(k) Manufacturing and Administrative overheads –16% of selling price.

(l) Selling overheads – 4% of the selling price.

Solution:

Calculation of working capital requirement

		₹
(a)	**Current assets**	
	(i) Raw materials in store – (69,000 × 25 × 2/12) (50% of selling price)	2,87,500
	(ii) WIP (69,000 × 31.5* × ½)	1,81,125
	(iii) Finished goods in store (69,000 × 38 × 3/12)	6,55,500
	(iv) Debtors (69,000 × 40 × 3/12)	6,90,000
	Total of current assets	18,14,125
(b)	**Current liabilities**	
	(i) Creditors (69,000 × 25 × 2/12)	2,87,500
	(ii) Wages (69,000 × 5 × 1/12)	28,750
	Total current liabilities	3,16,250

(c) Net working capital (A – B) 14,97,875

Assumptions

(a) Conversation cost (wages, manufacturing and other administrative overheads) are assumed to be equal to 50% for the determination of WIP.

(b) Sales are only in credit that means all 69,000 units are sold in credit.

Workings:

* WIP $69,000 \times 31.5 \times 1/12$

31.5 = (Material + 50% of direct wages + manufacturing and other Admin overheads)

$$= 25 + \frac{50}{100}\left[\left(\frac{10}{100} \times 50\right) + \left(\frac{16}{100} \times 50\right)\right]$$

$$= 25 + 0.5\,(5 + 8)$$

$$= ₹\ 31.5$$

7. The balance sheet of Company as follows as on March 31 of the country year.

Liabilities	₹	Assets	₹
Current liabilities	2,000	Current assets	8,000
Long-term funds	22,000	Fixed assets	16,000
	24,000		24,000

If current assets earn 2 per cent, fixed assets earn 14 per cent, current liabilities cost 4 per cent and long-term funds cost 10 per cent, calculate (*a*) total profits of assets, and the of current assets to total assets, (*b*) the cost of financing and the ratio of current liabilities to total assets, and (*c*) net profitability of the current financing plan.

Solution:

(*a*) Total profits on assets and ratio of current assets to total assets

Total profits on assets = (Profit on current assets + Profit on fixed assets)

(*i*) Profits on current assets = 0.02 × ₹ 8,000 = ₹ 160

(*ii*) Profits on fixed assets = 0.14 × ₹ 16,000 = 2,240

(*i*) + (*ii*) = ₹ 160 + ₹ 2,240 = ₹ 2,400

Ratio of current assets to total assets = ₹ 8,000, ₹ 24,000 = 0.33

(*b*) Cost of financing and ratio of current liabilities to total assets.

Total costs of financing = cost of financing of current liabilities + cost of financing of fixed assets.

(*i*) Cost of current liabilities = 0.04 × ₹ 2,000 = ₹ 80

(*ii*) Cost of long-term funds = 10 × ₹ 22000 = ₹ 2200

(*i*) + (*ii*) = ₹ 80 + ₹ 2200 = ₹ 2280

Ratio of current liabilities to total assets = ₹ 2000/₹ 24000 = 0.08.

(c) Net profitability of the current financial plan = Total profits – Total cost = ₹ 2400 – ₹ 2280 = ₹ 120.

8. Assume that in illustration 7 above, the Company has simultaneously shifted ₹ 2000 in current assets to fixed assets and ₹ 3000 in long-term funds to current liabilities. Answer part (*a*), (*b*) and (*c*) of illustration – 7 explain the differences, if any, in the ratios and the returns that result.

Solution:

(*a*) Total profits on assets and ratio of current assets to total assets.

Total profit on assets = Profits on current assets + Profits on fixed assets

(*i*) Profit on current assets = 0.02 × ₹ 6000 = ₹ 120

(*ii*) Profit on fixed assets = 0.40 × ₹ 18,000 = ₹ 7200

(*b*) Cost of financing and ratio of current liabilities to total assets

Cost of financing and ratio of current liabilities + cost of financing of long-term funds.

(*i*) Cost of current liabilities = 0.04 × ₹ 5000 = ₹ 200

(*ii*) Cost of long-term fund = 0.10 × ₹ 19000 = ₹ 1900

(*i*) + (*ii*) = ₹ 2100

Ratio of current liabilities to total assets = ₹ 5000/₹ 24000 = 0.208

(*c*) Net profitability = Total profits – Total cost = ₹ 2640 – ₹ 2100 = ₹ 450

9. The Prudential Company has investigated the profitability of its assets and the cost of it funds. The result indicates.

(*i*) Current assets earn	1 per cent
(*ii*) Fixed assets return	13
(*iii*) Current liabilities cost	3
(*iv*) Average cost of long-term funds	10

The current Balance Sheet is as follows:

Liabilities	₹	Assets	₹
Current liabilities	5000	Current assets	10,000
Long-term funds	35000		40000

(*a*) What is the net profitability?

(*b*) The company of contemplating lowering its net working capital to ₹ 3500 by (*i*) either shifting ₹ 1500 of current assets into fixed assets, or (*ii*) shifting ₹ 1500 of its long term funds into current liabilities. Work out the profitability for each of these alternatives. Which do you prefer? Why?

(*c*) Can both these alternative be implemented simultaneously? How would it affect the net profitability?

Solution:

(*a*) Net profit = Total profits – Total cost of financing

Total profit = Profit on fixed assets + return on current assets

Profit on fixed assets = 0.13 × ₹ 30,000 = ₹ 3900

Profit on current assets = 0.01 × ₹ 10000 = 100

Total = ₹ 4000

Total cost of financing = Cost of long-term financing + Cost of Current (Short-term funds) liabilities

Cost of long-term funds = 0.10 × ₹ 35000 = ₹ 3500

Cost of current liabilities = 0.03 × ₹ 5000 = ₹ 150

Total = ₹ 3,650

Net profit = ₹ 4,000 – ₹ 3,650 = ₹ 350

(*b*) (*i*) Shift of ₹ 1,500 of current assets into fixed assets

Profit on current assets = 0.01 × ₹ 8,500	85
Profit on fixed assets = 0.13 × ₹ 31,500	4,095
Total profit	4,180
Cost of financing, as in (*a*) above	3,650
Net profit (₹ 4,180 – ₹ 3,650)	530

(*ii*) Shift of ₹ 1,500 of long-term funds into current liabilities

Profit [as in (*a*)]	4,000
Cost of financing	
Cost of current liabilities = 0.03 × ₹ 6,500 = ₹ 195	
Cost of long-term funds = 0.10 × ₹ 33,500 = ₹ 3,350	3,545
Net profit (₹ 4,000 – ₹ 3,545)	455

The profitability of alternative *b* (*i*) is more, when ₹ 1,500 of current assets are shifted to fixed assets. It is, therefore preferable.

(*c*) If both the alternatives *b* (*i*) and *b* (*ii*) are implemented

Total profit	₹ 4,180	[as in *b* (*i*)]
Total cost	3,545	[as in *b* (*ii*)]
Net profit	635	

Obviously, the net profit is the highest in (*c*). However, risk has increased to the extent of the decline in net working capital from ₹ 3,500 in. alternative (*b*) (*i*) and (*ii*) to ₹ 2,000 in (*c*) alternative.

Notes

2.8. SUMMARY

- An adequate amount of working capital is essential for the smooth running of a business enterprise. The finance manager should forecast working capital requirements carefully to determine an optimum level of investment in working capital.

Notes

- One of the method for forecasting working capital requirement is based on the concept of operating cycle.
- Current liabilities generally effect computation of working capital. Hence, the amount of working capital in lowered to the extent of current liabilities (other than bank credit) arising in the normal cause of business.
- Shift working increase in the number of hours of production has an effect on the working capital requirements. The greatest economy in introducing double shift is the greater use of fixed assets.
- Working capital is the difference between current assets to current liabilities hence while estimating the requirement of working capital it is essential to forecast the amount or cash requirement for each item of current assets and current liabilities.
- Working capital management refers to the administration of all aspects of current assets, namely cash, marketable securities, debtors and stock i.e., inventories and current liabilities. The financial manager must determine levels and composition of current assets.
- The financial manager should determine the optimum level of current assets so that the wealth of share holders is maximized.
- A different way to risk-return trade-off is in terms of the cost of maintaining a particular level of current assets. There are two types of costs associated i.e.,
  1. Cost of liquidity
  2. Cost of illiquidity
- There are many methods in the determination of working capital needs. These are as below (which are practically in use).
  (*a*) Current assets holding period.
  (*b*) Ratio of sales.
  (*c*) Ratio of fixed investment.
- An optimum working capital ratio is dependent upon the business situation as such and the nature and composition of various current assets.
- The credit policy of the company also determines the requirements of working capital. This is because, in such a case, inventories have to be maintained at a high level.
- Working capital management polices have a great effect on the firms profit ability, liquidity and its structural health.

2.9. SELF-HELP QUESTIONS

1. Briefly explain the various factors in determining the working capital needs of a firm.
2. You are asked by the management to prepare a cash budget. What information would you require and from what sources would you obtain it for the following item.

(*i*) Plant and Machinery

(*ii*) Sundry Debtors

(*iii*) Interest

2.10. SELF-EXAMINATION QUESTIONS

Notes

1. How are net working capital, liquidity, technical insolvency, and risk related?
2. Why is an increase in the ratio of current to total assets expected to decrease both profits and risk as measured by net working by Capital?
3. How can changes in ratio of current liabilities to total assets affect its profitability and risk?
4. How would you expect both an increase in the ratio of current assets and a decrease in its ratio of current liabilities to total assets to affect profit and risk?
5. What is the basic premise of the hedging approach for meeting funds requirements? What are the effects of this approach on the profitability and risk?
6. What is the conservative approach to financing funds requirements? What kind of profitability-risk trade-off is involved?
7. If a firm has constant funds requirements throughout the year, which, if any, of the three Financing plans is preferable? Why?

   Do you agree with the following?

   (*i*) Double shift working requires a larger amount of funds for work-in-progress.

   (*ii*) There is normally a corresponding increase in stocks as double shift working is introduced.

   (*iii*) The cash cost working capital is lower because of the fact that sundry debtors include the profit element and non-cash cost.
8. (*a*) "Expenses reduce working capital, whereas charging of depreciation does no." Do working capital?

   (*b*) Can a company show a net-loss in its profit and loss account and an increase in the working capital.
9. Discuss various factors affecting working capital.
10. From the following information of ABC Ltd.:

    Compute: (*i*) Working capital requirement (*ii*) current ratio

    Balance Sheet as at 31.03.2000

Liabilities	₹ in 000's	Assets	₹ in 000's
Share Capital	50	Fixed Assets	70
Long-term Loans (₹ 5000 Payable in 1999)	40	Inventories	20
Sundry Creditors	10	Work-in-progress	10

Tax Payable	10	Sundry Debtors	20
Bill Payable	5	Cash	15
Expenses Payable	12		
Provision for Dividend	8		

Would the following action result in an increase in the total requirements of working capital or would they reduce the same? Give reasons briefly.

(*a*) Decrease in normal credit period allowed to customer from 20 days to 10 days.

(*b*) Purchase of the method of packing the production.

(*c*) Changing the method of packing the product. The new methods result in a more attractive packet. The time required for packing one unit of finished goods and the inventory level of packing material remains the same.

(*d*) The decision to store large quantity of a raw material, the price of which is expected to rise in future.

(*e*) Changing the method of depreciation.

(*f*) Decision to pay immediate cash for raw materials to suppliers in order to enjoy cash discounts.

(*g*) Implementing a scheme which cuts down the production period to half.

(*h*) Increase in wage rates.

11. You are consulted regarding the working capital requirements for project A. The relevant data are given below:

Raw materials cost = ₹ 0.75 per unit, Overheads = ₹ 15,000 per month
Labour = ₹ 0.60 per unit, Output/sales 10,000 units per month

Selling price = ₹ 5 per unit, Stocks to be carried

Raw materials = two weeks' production, Finished goods = 3 weeks' supply

Good remain in process for one month; raw materials are fed into the process immediately while labor and overheads accrue evenly during the month.

The debtors on an average are given 2.25 months credit. Half of the raw material suppliers have to be paid in cash while the others allow a credit period of one month.

The time lag in wages and overheads is one month. The company wishes to maintain a cash balance of ₹ 15000.

Calculate the working capital requirements for a month. Append any assumption or notes that you may wish to make.

12. The Hypothetical Ltd. has investigated the profitability of its assets and the cost of its Funds. The results indicate:

(*i*) Current assets earn, 6 per cent,

(*ii*) Fixed assets return, 13 per cent

(*iii*) Current liabilities cost, 3 per cent,

(*iv*) Average cost of long-term funds, 10 per cent.

13. In review question 15.8 above, what would be the net profitability if Hypothetical Ltd could earn 1 per cent on current assets and 8 per cent on fixed assets. The cost of current liabilities and long-term funds is 3 per cent and 10 per cent respectively? What recommendations would you made to the company? Why?

14. The Hypothetical Ltd. estimates its requirements of funds for the coming year to be constant at a level of ₹ 1,00,000. If the cost of both current liabilities and long-term financing 8 per cent, calculate the cost using the hedging and conservative approaches and discuss your preference with respect to applying either of them to finance the firm.

15. The hypothetical Ltd has forecast its total funds requirements for the coming year as follows:

Month	Amount (₹ Lakh)	Month	Amount (₹ Lakh)
January	30	July	200
February	30	August	180
March	40	September	110
April	60	October	70
May	100	November	40
June	150	December	20

The cost of short-term and long-term financing is expected to be 4 per cent and 10 per cent respectively, (*a*) Calculate the cost of financing using the hedging approach. (*b*) Calculate the cost of financing using the conservative approach, (*c*) Discuss the basic profitability risk trade off associated with each of these plans.

Answers

12. (*a*) ₹ 1700 (*b*) (*i*) ₹ 1910 (*ii*) ₹ 1910. (*c*) yes, the net profitability would be ₹ 2120.

13. Met; pss ₹ 500. Continue the existing plan.

14. The company would be indifferent between the hedging and conservative approaches to financing.

15. (*a*) ₹ 4.63 lakh, (*b*) ₹ 20, (*c*) ₹ 11.67 lakh.

Unit–3

Notes

Inventory Management

Structure

3.1. Introduction

The 3rd major current asset is inventory. The term inventory refers to the stockpile of the products a firm is offering for sale and the components that make up the product.

In other words inventory is composed of assets that will be sold in future in the normal cause of business operations.

The assets which firm store as inventory in anticipation of need are

(*i*) Raw materials

(*ii*) Work-in-progress (semi-finished goods)

(*iii*) Finished goods.

Raw material inventory contains items that are purchased by the firm from others and are converted into finished goods through the manufacturing/ production process. These are an important input of the final product.

The work-in-progress (WIP) inventory consists of items currently being used in the production process. These are usually semi-finished goods that are at the various stages of production in a multi-stage production process. Finished goods represents final or completed products which are available or ready for sale. The inventory of such goods consists of items that have been produced but are yet to be sold.

Inventory, as a current asset, differs from other current assets because only financial managers are not involved. Rather, all the functional areas, finance, marketing, production and purchasing are involved.

The views concerning the appropriate level of inventory world differ among the different functional areas.

The job of a financial manager is to reconcile the conflicting viewpoints of the various functional areas regarding the appropriate inventory levels in

order to fulfil the overall objective of maximizing the owner's wealth. Thus inventory management, like the management of other current assets, should be related to the overall objective of the firm.

3.2. OBJECTIVE

Notes

The basic responsibility of the financial manager is to make sure the firm's cash flows are managed efficiently. Efficient management of inventory should ultimately result in the minimization of the owner's wealth.

In order to minimise cash requirements, inventory should be turned over as quickly as possible, avoiding stock-outs that might result in closing down the production line or lead to a loss of sales. It implies that while the management should try to pursue the financial objective of turning inventory as quickly as possible, it should at the same time ensure sufficient inventories to satisfy production and sales demands. In other words, the financial manager has to reconcile these two conflicting requirements. Stated differently, the objective of inventory management consists of two counterbalancing parts—

(*i*) To minimise investment in inventory

(*ii*) To meet a demand for the product by efficiently organising the production and sales operations.

These two conflicting objectives of inventory management can also be expressed in terms of cost and benefit associated with inventory. That the firm should minimise investment is inventory implies that maintaining inventory involves costs, such that the smaller the inventory, the lower is the cost of the form.

$$\text{Inventory} \propto \text{Cost of firm}$$

But, inventories also provide benefits to the extent that these facilitate the smooth functioning of the firm, larger the inventory, the better it is firm this point of view. Obviously, the financial managers should aim at a level of inventory which will reconcile these conflicting elements means, an optimum level of inventory should be determined on the basis of the trade-off between costs and benefits associated with the level of inventory.

3.2.1 Cost of Holding Inventory

One operating objective of inventory management is to minimise cost. Excluding the cost of merchandise. The costs associated with inventory fall into following two basic categories.

(*i*) Ordering or acquisition or set-up costs

(*ii*) Carrying cost.

These costs are an important elements of the optimum level of inventory decisions.

3.2.1 (a) Ordering Costs

This category of costs is associated with the acquisition or ordering of inventory. Firm have to place orders with suppliers to replenish inventory of raw materials. The expenses involved are referred to as ordering costs.

Notes

Apart from placing orders outside, the various production departments have to acquire materials from the stores. Any expenditure involved here is also a part of the ordering cost. Ordering cost involves–

Preparing a purchase order or requisition form.

Receiving, inspecting and recording the goods received to ensure both quantity and quality.

The cost of acquiring materials consists of clerical costs and costs of stationary. It is therefore called a set-up cost. These are generally fixed/order placed, irrespective of the amount of the order.

Notes: 1. The larger the orders placed, or the more frequent the acquisition of inventory made, the higher are such costs.

2. From a different perspective, the larger the inventory, the fewer are the acquisition and the smaller/lower one the order costs.

Acquisition costs one inversely related to the size of inventory. These decline with the level of inventory.

$$\text{Acquisition cost} \propto \frac{1}{\text{Size of inventory}}.$$

Thus such costs can be minimised by placing fewer orders for a larger amount. But acquisition of a large quantity would increase the cost associated with the maintenance of inventory, that is carry cost.

3.2.1 (b) Carrying Cost

The second broad category of cost associated with inventory one the carrying costs. These are involved in maintaining or carrying inventory. The cost of holding inventory or carrytng cost. May be divided into following two categories:

(*i*) Cost arises due to storing of inventory

(*ii*) Opportunity cost of funds.

(*i*) Cost arises due to storing of inventory. The main components of this category of carrying cost are—

Storage cost i.e., tax, depreciation, insurance, maintenance of building, utilities and janitorial services.

Insurance of inventory against fire and theft.

Deterioration in inventory because of pilferage, five, technical obsolescence, style obsolescence and price decline.

Servicing costs i.e., labour for handling inventory, clerical and accounting costs.

(*ii*) Opportunity cost of funds. This consists of expenses in raising funds (interest on capital) to finance the acquisition of inventory. If funds were not looked up in inventory: would have earned a return. This is the opportunity cost of funds on the financial cost component of the cost.

The carrying costs and inventory size are positively related and move in the same direction. If the level of inventory increases, the carrying costs also increase and vice-versa.

$$\text{Carrying cost} \propto \text{size of inventory.}$$

Notes

Notes:	1. The sum of the ordering and carrying costs represents the total costs of inventory.
	2. When total cost of inventory is compared with the benefits arising out of the inventory to determine the optimum level of inventory.

3.2.2 Benefits of Holding Inventory

The second element in the optimum inventory decision deals with the benefits associated with holding inventory. The major benefits of holding inventory are the basic function of inventory. In other words, inventories perform certain basic functions which are of crucial importance in the firm's production and marketing strategies.

The basic function of inventories is to act as a buffer to decouple the various activities of a firm so that all do not have to be pursued at exactly the same rate. The key activities are as below:

(*i*) Purchasing

(*ii*) Production

(*iii*) Selling.

The term uncoupling means that these interrelated activities of a firm can be carried on independently. Without inventories, purchasing and production would be completely controlled by the sales schedules.

If the sales of a firm increases, these two would also increase and vice-versa. Means, purchase and production functions would depend upon the level of sales. It is of course, true that in the long run, the purchasing and production are infact tied to the sales activity of a firm. But, if in the short run, these are rigidly related, the three key activities cannot be performed efficiently.

Inventory/ies permit short term relaxation so that each activity may be pursued efficiently. "Inventories enable firms in the short run to produce at a rate greater than purchase of raw materials and vice-versa or to sell at a rate greater than production and vice-versa.

Since inventory enables uncoupling of the key activities of a firm, each one can be operated at most efficient rate. This has several beneficial effects on the firm's operations. There are three types of inventories — raw materials, work-in-progress and finished goods, perform certain useful function. The effect of uncoupling *i.e.*, maintaining inventory are as follows—

(*a*) Benefits in purchasing

(*b*) Benefits in production

(*c*) Benefits in work-in-progress

(*d*) Benefits in sales.

Notes

3.2.2. (a) Benefits in purchasing

If the purchasing of raw materials and other goods is not tied to production/sales means a firm can purchase independently to ensure the most efficient purchase, several advantages would become available.

In the first place, a firm can purchase larger quantities than is warranted by useage in production or sales level. This will enable it to avail of discounts that are available on bulk purchases.

Moreover, it will lower the ordering cost as fewer acquisition would be made. There will, thus be a significant saving in the costs.

Secondly, firms can purchase goods before anticipated or announced price increases. This will lead to decline the cost of production.

Inventory, thus, serves as a hedge against price increases as well as shortages of raw materials. This is a highly desirable inventory strategy.

3.2.2. (b) Benefits in production

Finished goods inventory severs to uncouple production and sale. This enables production at a rate different from that of sales, *i.e.*, production can be carried on at a rate higher or lower than the sales rate. This would be of special advantage to firms with seasonal sales pattern. In this case, the sales rate will be higher than the production rate during a part of the year *i.e.*, peak season and lower during the off season. The choice with the firm is either to produce at a level to meet the actual demand, that is higher production during peak season and lower or nil production during off season or produce continuously throughout the year and build up inventory which will be sold during the period of season demand.

The farmer involves discontinuity in the production schedule while the latter ensures level production. The level production is more economical as it allows the firm to reduce the cost of discontinuities in the production process.

This is possible because excess production is kept as inventory to meet the future demands. Thus inventory helps a firm to coordinate its production scheduling so as to avoid disruption and the accompanying expenses.

Note: Inventory permits least cost production scheduling, production can be carried or more efficiently.

3.2.2. (c) Benefits in work-in-progress

Inventory of work-in-progress perform following in functions.

It is necessary because production processes are not instantaneous. The amount of such inventory depends upon technology and the efficiently of production. The larger the step involved in the production process, the larger the work-in-progress inventory and vice-versa.

Number of steps in production process $\propto$ WIP inventory

By shortening the production time, efficiency of the production process can be improved and the size of this type of inventory reduced.

In the multi-stage production process it uncouples the various stages of production so that all of these do not have to performed at the same rate. The stages involving higher set-up costs may be most efficiently performed in batches with a W.I.P inventory accumulated during a production run.

Notes

3.2.2. (d) Benefits in sales

The maintenance of inventory also helps a firm to enhance its sales efforts.

If there are no inventories of finished goods, the level of sales will depend upon the level of current production. A firm will not be able to meet demand instantaneously. There will be a log depending upon the production process.

If the firm has inventory, actual sales will not have to depend as lengthy manufacturing processes. Thus, inventory serves to bridge the gap between current production and actual sales.

A related aspect is that inventory serves as a competitive marketing tool of meet customer demands. A basic requirement in a firm's competitive position is its ability vis-a-vis its competitions to supply goods rapidly. If it is not able to do so, the customers are likely to switch to supplier who can supply goods at short notice:

Notes: 1. Inventory thus ensures a continued patronage of customers.

2. In case firm having a seasonal pattern of sales, there should be a substantial finished goods inventory prior to the peak sales season, failure to do so may mean a loss of sales during the peak season.

3.3. INVENTORY MANAGEMENT TECHNIQUES

Financial managers should aim at an optimum level of inventory on the basis of trade-off between costs and benefit to maximise the owners wealth. Many sophisticated mathematical techniques are available to handle inventory management problems. Following are a few simple production-oriented methods/techniques of inventory control to indicate a broad framework for managing inventories efficiently in conformity with the good of wealth maximization. The major problems areas that comprise the heart of inventory control are—

1. Classification problem to determine the type of control required.
2. The order quantity problem.
3. The order point problem.
4. Safety stocks.

3.3.1 (a) Classification Problem—ABC System

The first step in the inventory control process is classification of different types of inventories to determine the type and degree of control required for each.

Notes

The ABC system is a widely used classification technique to identify various items of inventory for purposes of inventory control. This technique is based on the assumption that a firm should not exercise the same degree of control on all items of inventory. It should rather keep a more rigorous control on items that are:

(*i*) The most costly

(*ii*) Slowest turning

While items that are less expensive should be given less control efforts.

On the basis of cost involved, the various inventory items are, according to this system, categorised into following three classes.

1. Class A
2. Class B
3. Class C

The items included in class 'A' involve the largest investment. Therefore, inventory control should be the most rigorous and intensive and the most, sophisticated inventory control techniques should be applied to these items.

The class, '*c*' consists of items of inventory which involve relatively small investment although the number of items is fairly large. These items deserve minimum attention.

The class 'B' stands midway. It deserves less attention than 'A' but more than 'C'. It can be controlled by employing less sophisticated techniques.

The take of inventory management is to properly classify all the inventory items into one of these three categories/classes.

The typical break down of inventory items is as below:

Class	No. of items (%)	Inventory value %
A	15	70
B	30	20
C	55	10

Notes:

1. Class 'A' is the least important in term of the number of items, it is by far the most important in terms of the investment involved. With only 15% of the number, it accounts for as much as 70% of the total value of inventory. The firm should direct most of its inventory control efforts to the items included in this group.
2. The items comprising 'B' class account for 20% of the investments in inventory. Class 'B' deserves less attention than 'A' but more than 'C'.
3. Class 'C' involves only 10% of the total value although numberwise its share is as high as 55%.

Example: A firm has 7 different items in its inventory. The average number of each of these items held, along with their unit costs is as below.

The firm wishes to introduce ABC inventory system. Suggest a break down of the items in ABC system.

Item No.	Average No. of units in iventory	Average cost/unit (₹)
1	20,000	60.80
2	10,000	102.40
3	32,000	11.10
4	28,000	10.28
5	60,000	3.40
6	30,000	3.00
7	20,000	1.30

Solution: ABC analysis.

Item	Units	% of total	Unit cost	Total cost	% of total
1	20,000	10 ┐ 15	60.80	12,16,000	38.00 ┐ 70
2	10,000	5 ┘	102.40	10,24,000	32.00 ┘
3	32,000	16 ┐ 30	11.10	3,52,000	11.00 ┐ 20
4	28,000	14 ┘	10.28	2,88,000	9.00 ┘
5	60,000	30 ┐	3.40	2,04,000	6.38 ┐
6	30,000	15 55	3.00	90,000	2.80 10
7	20,000	10 ┘	1.30	26,000	0.82 ┘

Item 1 and 2 combine together are of 15% whereas cost % is 70, hence are placed in class 'A'. Items 3 and 4 combine together are of 30% whereas cost % is 20, hence are placed in class 'B'. Items 5, 6 and 7 combine together are of 55% whereas cost % is 10, hence are placed in class 'C'.

Note: Though ABC classification is quite simple but must used with caution. At times an item may be very expensive but very critical in the process of production.

Advantages of ABC analysis

The advantages of ABC analysis are as follows:

1. It becomes possible to concentrate all efforts in areas which need genuine efforts.
2. This method produces rewarding results, at the same time it involves minimum control.
3. In respect of class 'A' items care attention is paid at every step *i.e.*, estimates of requirements, purchasing, safety stock, receipts, inspection, issues etc. A tight and loose control is exercised. A close watch on high consumption items and their progress of

Notes

replenishment use etc., is maintained. But 'C' class items, which are numerous and at the same time inexpensive one comparatively left loose controlled.

4. Those items which fall under class 'C' may be dispersed with in the record-keeping system as well, physical division of these items into two unequal sections may help in saving time, money and labour without endangering the production schedule;
5. It is the most effective and economical method as it is based on selective approach.
6. It helps in placing the order. Deciding the quantity of purchase, safety stock etc. Thus, saving the enterprise/firm from unnecessary stock cuts or surpluses and their resultant consequences.

ABC analysis pattern

The control on inventories under selective approach may follow the following pattern–

Sl. No.	Summary of control	Class A	Class B	Class C
1	Control (process)	Tight	Moderate	Loose
2	Requirement	Exact	Exact	Estimate
3	Recording	Individual	Individual	Group
4	Cluch of revision	Close	Some	Little
5	Quality Control	Exact	Exact	Approximate
6	Expecting	Regular	Some	No.

Broad Policy Differences between ABC items

ABC analysis is carried with an object of evolving a policy guidelines for selective materials control under the method. For an effective and purposeful analysis policy guidelines are based on differences between the three – ABC types of items.

A broad policy guidelines may be established and followed. The establishment of such guidelines may help in achieving the objects which the ABC method of inventory classification sets for itself. The objects of the method may be enumerated as the broad policy differences or guidelines which are easy to evolve once materials are classified as ABC items.

Following table shows the broad policy difference between the three classes of items.

Sl. No.	Point of difference	'A' Class	'B' Class	'C' Class
1.	Value (monetary)	High consumption	Moderate consumption	Low Consumption
2.	Safety stock	No or very low	Low	High
3.	Ordering frequency	Usually frequent	Monthly/ Quarterly	Half-yearly

4.	Control reports	Weekly	Monthly	Quarterly
5.	Follow-up action	Maximum	Periodical	Exceptional
6.	Values analysis	Rigorous	Moderate	Minimum
7.	Source of supply	Maximum/Many	May be two-three	Minimum
8.	Fore costs	Accurate	Estimates	Approximates
9.	Surplus/ Obsolescence	Nil or minimum	Quarterly control	Annual control
10.	Purchasing	Centralised	Combined	Decentralised
11.	Storage	Centralised	Combined	Decentralised
12.	Lead time	Minimum	Moderate	As required
13.	Handling	Top one level	Middle level	Operating staff
14.	Coding	Red column	Pink column	Blue column
15.	Incharge	Maximum two people	Group of people but small	Group of people (bigger)

Limitation of ABC analysis

This analysis is not foolproof. It suffers from certain limitations which later methods have tried to remove. The limitations are as below:

1. It an achieve its objectives only when there is a popular standardization of materials being carried in the store house. A good system of codification two is required for effectively carrying out the analysis.
2. The base of ABC analysis is "grading of items" carried in the store house. The grading of items is done according to the importance of performance of the item under gradation. The gradation of item is obviously done on the basis of vital (V), Essential (E) and desirable (D). Vitality, essentiality and desirability of the items speak for themselves and any analysis has to be based on these. Any item may be having zero or minimum monetary value but may be vital for the functioning of organizations smoothly and efficiently.
3. The inventory position may be analysed according to the value of the item. Thus, a periodic review and updating is mandatory in ABC analysis.
4. ABC analysis which primarily based on monetary value of the item ignoring other important factors.
5. Despite the above limitation, still the ABC analysis is an effective tool and serves very useful purposes.

VED Analysis

It is quite similar to ABC analysis but largely applicable to spare parts. Spare parts are classified as vital, Essential and Desirable according to their requirement.

Notes

Spares classified as 'V' (vital) are stocked adequately to ensure smooth plant operations. These spares are those which may cause havoc and may amount to stoppage work in the organization if are not available at the time of requirement.

However, the organization may take a reasonable risk in case of those spares which are classified as 'E' (Essential). These items can be sufficiently stocked to ensure a regular flow but care should be taken that if sufficient stock of 'E' items are not available then it may effect the efficiency of the organisation. Therefore, it is necessary to have adequate arrangement for their replenishment at a short notice. The suppliers of 'E' items should be reliable and should be such who may be ready to supply the items as and when needed.

'D' (Desirable) spares are those which can be easily bought from the market as and when these are needed. The lead time of such items is always law and their procurement at any time or at any stage is not going to pase any problem.

VED classification is helpful to those industries which largely depend on their plant and machinery.

Notes: 1. Use of VED analysis is most advantageous in the capital intensive industries.

2. Transport industry should invariably option for VED an analysis.

P. Gopala Krishanan and MS Sandilya have suggested a combination of ABC and VED analysis. In order to control the stacking of spare parts.

According to them control action may be classified as AV, BE and CD. They are of the opinion that in such cases it will be advantageous to have a centralised system of storage so far as the spare parts are concerned, particularly an undertaking which is organised as multi-unit organisation.

Pattern of ABC-VED analysis

VED → / ABC↓	V	E	D
A	Constant control 'E' regular follow up.	Moderate stocks	Nill stocks
B	Moderate stocks	Moderate stocks	Very low stocks
C	High stocks	Moderate stocks	Low stocks

FSN Analysis

It is based an movement of item from and in the store. The items are classified as 'F' (fast moving, 'S' (slow moving) and 'N' (non-moving). The classification is based upon the movement/ consumption pattern of the items under analysis. This analysis is useful in case of obsolete items. Previous year's issues is the guiding factor for FSN analysis. Previous 2-3 years consumptions are taken into consideration for decision. Whether the items stocked in store are fast moving, slow moving or non-moving.

Notes

Certainly, such analysis and method of analysis is useful in locating and identifying the obsolete items.

This analysis helps in avoiding investments is non-moving or slow moving items. FSN analysis is also useful in presenting obsolescence and facilities timely control.

3.3.2 Order Quantity Problem

Economic Order Quantity (EOQ) Model: After various inventory items are classified on the basis of suitable analysis, the management becomes aware of the type of control that would be appropriate for each of class of inventory items.

A key inventory problem while purchasing raw materials or finished good, how much inventory should be purchased/bought in one lot under one order on each replenishment? Should the quantity to be purchased be large or small? or should the requirement of materials during a given period of time be acquired in one lest or should it be acquired in instalments or in several small lots? Such inventory problems are called order quantity problems.

The determination of the appropriate quantity to be purchased in each lot to replenish stock as a solution to the order quantity problem necessitates resolution of conflicting goals.

Notes:

1. Buying a large quantities implies a higher average inventory level which will assure (*a*) smooth production/sales operation and (*b*) lever ordering or set up casts. But will involve higher carrying cost.
2. Small orders would reduce the carrying cast of inventory by reducing the average inventory level but the ordering casts would increase as there is a livelihood of interruption in operations due to stock run arts.

A firm should place neither too larger nor too small orders. On the basis of trade off between benefits derived firm the availability of inventory and the cost of carrying that level of inventory, the appropriate or optimum level of the order to be placed should be determined.

The optimum level of inventory is popularly referred to as the Economic Order Quantity [EOQ]. It is also know as economic lot size.

The Economic Order Quantity [EOQ] may be defined as the level of inventory order that minimises the total cost associated with inventory management.

The costs associated with inventories are—

(*i*) Ordering costs, (*ii*) Carrying cost

EOQ refers that level of inventory at which the total cost of inventory comprising acquisition/ ordering/set-up costs and carrying cost is minimal.

Notes

Assumption for EOQ

The EOQ model, as the technique to determine the economic order quantity is based upon following three restrictive assumptions:

(*a*) The firm knowns with certainty the annual usage (consumption) of a particular item of inventory.

(*b*) The rate at which the firm uses inventory is steady over time.

(*c*) The orders placed to replenish inventory stocks are received at exactly that point in time when possible inventory levels being considered.

Approaches

The EOQ model can be understood by—

(*i*) Long analytical approach or trail and error approach,

(*ii*) The shortcut or simple mathematical approach.

Long analytical/trial and error approach—Given the total requirements of inventory during a given period of time depending upon the inventory planning horizon, a firm has different alternatives to purchase its inventories like:

It can buy its entire requirements in one single lot at the beginning of the inventory planning period.

The inventories may be procured in small lots periodically.

If the purchases are made in one lot, the average inventory holdings would be relatively large whereas it would be relatively small when the acquisition of inventory is in small lots. The smaller the lot the lever is the average inventory and vice-versa.

$$\text{Lot size} \propto \text{average inventory}$$

High average inventory would involve high carrying costs.

On the other hand, low inventory holdings are associated with high ordering cost.

The trial and error or long analytical approach for the determination of EOQ uses different permutations and combinations of lots of inventory purchases so as to find at the least acquisition costs for different sizes of orders to purchase inventories are computed and the order size with the lowest total cost *i.e.*, ordering plus carrying of inventory is the economic order quantity. The mechanics of the computation of EOQ with the analytical approach is as follows:

Example: A firm's inventory planning period is one year. Its inventory requirement for this period is 1600 units. If the acquisition cost is ₹ 50 per order. The carrying costs are expected to be ₹ 1 per unit/year for an item.

The firm can procure inventories in various lots as below: (*i*) 1600 units (*ii*) 800 units (*iii*) 400 units, (*iv*) 200 units, (*v*) 100 units. Which of these order quantities is the EOQ.

Solution:

Inventory Costs for Different Order Quantities:

1.	Size of order (units)	1,600	800	400	200	100
2.	Number of orders	1	2	4	8	16
3.	Cost per order	50	50	50	50	50
4.	Total ordering cost	50	100	200	400	800
5.	Carry cost/unit (₹)	1	1	1	1	1
6.	Average inventory (unit)	800	400	200	100	50
7.	Total carrying cost (₹)	800	400	200	100	50
8.	Total cost (4 + 7) (₹)	850	500	400	500	850

Working notes:

(*i*) No. of orders = Total inventory requirements/order size.

(*ii*) Average inventory = Order size/2.

From the above total cost it reveals that–

The carrying and ordering costs when taken together are the lowest for the ordering size of 400 units hence its is the EOQ.

Mathematical approach (shortcut method)

The economic order quantity can, using a shortcut method, be calculated by the following formula.

where A → Annual usage of inventory in units

B → Buying cost per order

C → Carrying cost per unit.

From the above example

$$A = 1600 \text{ units}$$

$$B = ₹50$$

$$C = ₹1$$

Then,
$$EOQ = \sqrt{\frac{2 \times A \times B}{C}}$$

$$= \sqrt{\frac{2 \times 1600 \times 50}{1}}$$

$$= \sqrt{3200 \times 50} = \sqrt{160000}$$

$$= 100 \times \sqrt{16} = 100 \times 4 = 400 \text{ units.}$$ **Ans.**

Limitations

It suffer from short comings due to the restrictive nature of the assumptions.

Notes

1. The assumption of a constant consumption/usage and the instantaneous replishment of inventory is of doubtful validity. Deliveries from suppliers may be slower than expected for reasons beyond control. It is also possible that there may be an unusual and unexpected demand for stocks. To meet such contingencies, firms have to keep additional inventories which are known as safety stocks.
2. Assumption of a known annual demand for inventories is open to question. There is likelihood of a discrepancy between the actual and the expected demand, leading to a wrong estimate of EOQ.
3. In addition, there are same computational problems involved. A more difficult situation may over when the number of orders to be placed may turn out to be a fraction.

3.3.3 Order Point

The EOQ technique determines the size of an order to acquire inventory so as to minimise the carrying as well as the ordering costs. In other words EOQ provides an answer to the question. How much inventory should be ordered in one lot? Another important question pertaining to efficient inventory management is when should the order to procure inventory be placed? It is known as reordering point.

Reordering point is stated in terms of the level of inventory at which an order should be placed for replenishing the current stock of inventory. In other words, reorder point may be defined as the level of inventory when fresh order should be placed with the suppliers for procuring additional inventory equal to the economic order quantity.

A simple formula to calculate the reorder point is based upon following assumptions

(*i*) Constant daily usage of inventory

(*ii*) Fixed lead time.

In other words, the formula assumes conditions of certainty.

The reorder point = lead time in days × average daily usage of inventory.

or $$ROP = LT \times ADU.$$

$$OP_R \text{ or } L \times U.$$

Where ROP or OP_R = Reording point

LT or L = Lead time in days.

ADU or U = Average daily usage of inventory lead time refers to the time normally taken in receiving the delivery after placing orders with the suppliers. It covers the time span from the point when a decision to place the order for the procurement of inventory is made to the actual receipt of the inventory by the firm.

In other words the lead time consists of number of days required by the supplier to receive and process the order as well as the number of days

during which the goods will be in transit from the supplier. The lead time may also be called as the procurement time of inventory.

The average usage means the quantity of inventory consumed daily. Therefore, reorder point can be defined as the inventory level which should be equal to the consumption during the lead time.

Notes

Example: The average consumption or daily usage of inventory in a firm is 10,000 units. The number of days required to receive the delivery of inventory other placing order *i.e.*, lead time or (LT/L) is 15 days.

Calculate reordering point.

Solution:

The reordering point = O

$OP_R = L \times U$ L = 15 days

$= 15 \times 10{,}000$ U = 10,000 units

= 1,50,000 units.

Means, the firm should place an order for replenishment the stock of inventory as soon as the level reaches 1,50,000 units. The size of the order would obviously be equal to the EOQ.

3.3.4 Safety Stock

The economic order quantity and the reorder point are on the assumption of certainty conditions *i.e.*,

(*i*) Constant/fixed usage/ requirement of inventory

(*ii*) Instantaneous replenishment of inventory.

These assumptions are subjected to questionable validity in central conditions/situations.

For instance, the demand for inventory is likely to fluctuate from time to time. In particular, at certain points of time the demand may exceed the anticipated level. In other words, a discrepancy between the assumed or estimated or anticipated or expected and actual usage rate of inventory is likely to occur in practice. Similarly, the receipt of inventory from the suppliers may be delayed beyond the expected/pre calculated lead time. The delay may arise from strikes, floods, transportation and other inforseen bottlenecks. Thus, a firm would come across situations in which the actual usage of inventory is higher than the anticipated level and/or the delivery of the inventory from the supplier is delayed.

The effect of increased and/or slower delivery would lead to shortage of inventory. That is, the firm would face a stock-out situation. This would disrupt the production schedule and alimate the customers. The firm would, there fore, be well advised to keep a sufficient safety margin by having an additional inventory to guard against stock-out situation. Such stocks are called safety stocks.

Notes

This safety stocks act as a buffer or cushion against stock-out situation/ possible shortage of inventory caused either by increased usage or delayed delivery of inventory.

The safety stock may be defined as the minimum additional inventory to serve as a safety margin or buffer or cushion to meet an unanticipated increase in usage resulting from an unusually high demand and or an uncontrollable late receipt of incoming inventory.

The safety stock involves two types of costs:

(*i*) Stock-out

(*ii*) Carrying cost.

The job of working capital manager is to determine the appropriate level of safety stock on the basis of trade-off between these two above discussed conflicting costs.

The stock-out costs refers to the cost associated with the shortage (stock-out) of inventory, the firm would be deprived of certain benefits. The denial of those benefits which would otherwise be available to the firm are the stock-out costs.

The first and most important of these costs, is the loss of profit. Which the firm could have earned from increased sales if there was no shortage of inventory.

Another category of stock-out-costs is the damage to the relationship with the customers. Owing to stortage of inventory, the firm would not be able to meet the customer's requirements and the latter may turn to the firm's competitions. It should of course be clearly understood that this type of cost cannot be easily and precisely quantified.

Last, the shortage of inventory may distrupt the production schedule of the firm. The production process would grind to a halt involving idle time.

The carrying costs are the costs associated with the maintenance of inventory. Since the firm is required to maintain additional inventory, in evens of the normal usage, additional carrying costs are involved.

The stock-out and the carrying costs are counter balancing. The longer the safety stock the larger would be the carrying cost and vice-versa.

Safety stock $\propto$ carrying cost.

Larger is the safety stock, the smaller would be the stock-out-costs.

Safety stock 1/$\propto$ stock-out-costs.

In other words, if the firm minimises the carrying cost the stock-out-costs are likely to rise, on the other hand, an attempt to minimise the stock-out-costs implies to increased carrying costs.

The object of the working capital manager should be to have the lowest total cost *i.e.*, carrying cost + stock-out-costs.

The safety stock with the minimum carrying and stock-out costs is the economic or appropriate level which a working capital manager should aim at.

The appropriate level of safety stock is determined by the trade-off between the stock-out and the carrying costs.

Example: The experience of a firm being out of stock is as below.

(*a*)

Stock out (number of units)	No. of times
500	1 (1)
400	2 (2)
250	3 (3)
100	4 (4)
50	10 (10)
0	80 (below 80)
Total	100

Figures is bracelets represents percentage of time the firm has been out of stock.

(*b*) Assume that the stock-out costs are ₹ 40 per unit.

(*c*) The carrying cost of inventory/unit is ₹ 20. Determine the optimum level of stock-out inventory.

Solution:

Computation of expected stock-out-costs—Determination of the optimum safety stock involves dealing with uncertain demands. The first step therefore is to estimate the probability of being out of stock as well as the size of stock-out in terms of the shortage of inventory at different levels of safety stock.

The shortage of inventory at different levels of safety stock can be computed as follows–

(*a*) The firm's experience has been that it has been short of inventory by 500 units only once in 100 times. If therefore the level of safety stock is 500 units. It will never be short of inventory means that with 500 units of safety stock. The size of stock-out would be 'zero'.

(*b*) When the firm has a safety stock of 400 units. It could be short by 100 units.

(*c*) When the safety stock is 250 units means there is a shortage of 250 units of the actual demand turns out to be 500 units greater than expected. If the demand turn out to be 400 there will be a shortage of 150 units. Thus, the size of stock-out could be 250 units or 150 units depending upon the level of actual demand.

(*d*) It should be obvious that the size of stock-out increases with a decrease in the level of safety stock. The size of stock-out for safety stock levels of 100 units, 50 units and 0 units can be computed on the lines of step '*c*'.

Notes

Safet-stock level (unit)	Stock-out (unit)	Stock-out cost (₹ 40/ unit) (in ₹)	Probability of stock-out	Expected stock-out-cost at this leves (in ₹)	Total expected stock-out cost (₹)
500	0	0	0	0	0
400	100	4,000	0.01	40	40
250	250 150	10,000 6,000	0.01 0.2	100 120	220
100	400 300 150	16,000 12,000 6,000	0.01 0.02 0.03	160 240 180	580
50	450 350 200 50	18,000 14,000 8,000 2,000	0.01 0.02 0.03 0.04	180 280 240 80	780
0	500 400 250 100 50	20,000 16,000 10,000 4,000 2,000	0.01 0.02 0.03 0.04 0.10	200 320 300 160 200	1,180

Working notes:

Probability of stock-out can be computed as below.

(*a*) If the safety stock of the firm is 500 units. There is no chance of the firm being out of stock. The probability of stock-out is therefore zero.

(*b*) When the safety stock is 400 units there is 1% chance that the firm will be short of inventory. The probability of stock-out is therefore 0.01.

(*c*) The probability of stock-out for other levels of safety stock is similarly computed is 'col 4' of above table.

After the determination of the size and probability of stock-out, the next step is the calculation of the stock-out cost. The expected stock-out cost can be calculated by multiplying the stock-out cost and the probability of stock-out.

The next step is to compute the total expected stock-out cost.

Now carry cast is to be calculated. Which is equal to the safety stock multiplied by the carry cost/unit.

Computation of Total Safety stock-cost—

Safety stock level (units)	Expected stock-out-cost (₹)	Carrying cost (₹ 20/units) (₹)	Total safety stock cost (₹)
0	1,180	0	1,180
50	780	1,000	1,780
100	580	2,000	2,580
250	220	5,000	5,220
400	40	8,000	8,040
500	0	10,000	10,000

Finally, the carry costs and the expected stock-out costs at each safety stock level should be added. The optimum safety stock would be that level of inventory at which total of these two costs is the lowest.

In the above example the lowest total safety stock cost is at zero level.

3.4. ILLUSTRATIONS

1. Following details are available in respect of a firm
   (*i*) Annual requirement of inventory – 40,000 units
   (*ii*) Cost/unit (including carrying and ordering cost) – ₹/16
   (*iii*) Carrying cost = 15% / year
   (*iv*) Ordering cost = 480 ₹ per order.

   Determine EOQ?

   Solution:

$$EOQ = \sqrt{\frac{2AB}{C}}$$

$$A = 40{,}000,\ B = 480,\ C = 16 \times 0.15 = 2.40$$

then

$$EOQ = \sqrt{\frac{2 \times 40{,}000 \times 480}{2.4}}$$

$$= \sqrt{\frac{80{,}000 \times 480}{2.4}}$$

$$= \sqrt{80{,}000 \times 200}$$

$$= \sqrt{1{,}60{,}00{,}000}$$

$$= 4000 \text{ units.}$$

2. An enterprise require 90,000 units of certain items annually. Cost/unit = ₹ 3, cost per purchase order = ₹ 300 inventory carrying cost ₹ 6/unit par year.

   Find, (*a*) EOQ. (*b*) What should the firm do if the suppliers offer discounts as below.

Notes

Order quantity	Discount (%)
4,500 – 5,999	2%
6000 and above	3%

Solution:

(*a*) $$EOQ = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 90,000 \times 300}{6}}$$

$$= \sqrt{\frac{18,000 \times 300}{6}}$$

$$= \sqrt{30,000 \times 30} = \sqrt{90,00,000}$$

= 3000 units.

(*b*) Determination of optimal order quantity

(*i*) Order size (units)	3,000	45,000	6000
(*ii*) Average inventory (units)	1500	2,250	3000
(*iii*) Annual requirement (units)	90,000	90,000	90,000
(*iv*) No of orders, (*iii*/*i*)	30	20	15
(*v*) Price/unit (₹)	3	2.94*	2.91**
(*vi*) Cost of purchase (₹) (*vxiii*)	2,70,000	2,64,600	2,61,900
(*vii*) Carrying cost @ 6 ₹/unit (₹)	9,000	13,500	18,000
(*viii*) Total ordering cost (₹)	9,000	6,000	4,500
(*ix*) Total cost (*vi* + *vii* + *viii*)	2,88,000	2,84,100	2,84,400.

Working notes:

* Price/unit – 3 × 2% = 3 × 2/100 = 2.94

** – 3 × 3% = 3 × 3/100 = 2.91

Interpretation

The above calculation indicates that

(*a*) When ordering quantity is 3000 which is EOQ is followed the total cost is equal to ₹ 2,88,000

(*b*) When ordering quantity is 4,500 which is above EOQ. The supplier extends 2% discount on the price where by price comes down to ₹ 2.94/unit and results in cutting down the total cost to ₹ 2,84,100.

(c) When ordering quantity is 6,000 which is also above the EOQ, infact double the EOQ. The total cost again goes up to ₹ 2,84, 400. Hence enterprise should go for 4,500 units instead of EOQ that 3000 units. Because purchasing 4500 units is most profitable.

3. In an enterprise, A and B components are used as below-

(*a*) Normal usage – 50 units/week.

(*b*) Minimum usage – 25 units/week.

(c) Maximum usage – 75 units/ week.

(d) Recording quantity – (A) – 300 units
(B) – 500 units.

(e) Reorder period – (A) – 4 to 6 weeks
(B) – 2 to 4 weeks.

Notes

Ascertain

(i) Reorder level

(ii) Minimum level

(iii) Maximum level

(iv) Average stock level.

Solution:

(i) Reorder level = (maximum usage * maximum delivery time).

For (A) – 75×6 = 450 units

For (B) – 75×4 = 300 units.

(ii) Minimum level = Reorder level – (normal usage × average delivery time in weeks)

For (A) = $450 - (50 \times 5) = 450 - 250 = 200$ units

For (B) = $300 - (50 \times 3) = 300 - 150 = 150$ units.

(iii) Maximum level = Reorder level – (Minimum usage × minimum delivery time) + reorder quantity

For (A) = $450 - (25 \times 4) + 300 = 450 - (100) + 300$

$= 450 + 300 - 100 = 650$ unit

For (B) = $300 - (25 \times 2) + 500 = 300 - (50) + 500$

$= 300 - 50 + 500 = 750$ units

(iv) Average stock level = minimum level + $\left(\frac{\text{recorder quantity}}{2}\right)$

For (A) = $200 + \frac{300}{2} = 200 + 150 = 350$ units.

For (B) = $150 + \frac{500}{2} = 150 + 250 = 400$ units.

4. With the help of following information find out the most economic order quantity and how often will an order need to be placed?

(a) Carrying cost – 15%.

(b) Ordering cost – ₹ 9/order.

(c) Estimated annual consumption – 38,000 units.

(d) Price/unit – ₹ 4.

Solution:

$$EOQ = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 38,000 \times 9}{0.6^*}}$$

Notes

$$= \sqrt{\frac{76000 \times 9}{0.6}} = \sqrt{\frac{760000 \times 9^3}{6_2}}$$

$$= \sqrt{380000 \times 3}$$

$$= \sqrt{1140000} = 10.770 \times 100$$

$$= 1077 \text{ units.}$$

Time after which an order is to be placed is

$$= \frac{\text{EOQ}}{\text{Consumption/day (usage/365)}} = \frac{1077}{38000/365}$$

$$= \frac{1077 \times 365}{38000} = \frac{393105}{38000} = 10 \text{ days.}$$

Working notes:

Total carrying cost = 38,000 × 4 × 0.15 = 22,800

Carrying cost/unit = 22,800/38000 = 0.6.

5. A manufacturer buy costing equipment from outside suppliers @ ₹ 30/unit. The Total annual usage is 800 units. Annual return on investment = 10%, rent, insurance, taxes per unit per year = ₹ 1, cost of placing an order ₹ 100. Ascertain the eoq.

Solution:

$$\text{EOQ} = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 800 \times 100}{4^*}} = \sqrt{\frac{160000}{4}} = \sqrt{40000}$$

$$= 200 \text{ units.}$$

$$^* \text{Total intrest cost} = \frac{800 \times 30 \times 10}{100} = ₹ 2,400$$

Interest cost/unit = 2,400/800 = ₹ 3.

Carrying cost/unit = ₹ 3 + ₹ 1 (Rest + insurance + taxes)

= ₹ 4.

6. A company has been buying a given item in lots of 1,200 units which is a six months supply, the cost/unit is ₹ 12, order cost is ₹ 8/order, carrying cost is 25% calculate the savings/year by buying in economical lot quantities?

Solution:

Total carrying cost = 2400 × 12 × 25/100

$$= 2400 \times 12 \times \frac{1}{4}$$

= 2400 × 3 = 7200 units.

Carrying cost/unit = 7200/2400 = ₹ 3.

$$EOQ = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 1200 \times 2 \times 8}{3}}$$

$$= \sqrt{2 \times 400 \times 2 \times 8} = 114 \text{ units.}$$

Notes

Savings due to EOQ

Sl. No.	Particulars	Existing	With EOQ
1.	SIze of order (units)	1,200	114
2.	No. of orders	2	22
3.	Cost/order (₹)	8	8
4.	Total ordering cost (2 × 3) (₹)	16	176
5.	Carrying cost/unit (₹)	3	3
6	Average inventory (units)	600	57
7.	Total carrying cost (5 × 6) (₹)	1,800	171
8.	Total Cost (4 + 7) (₹)	1816	347

Saving (₹) (1816 – 347) = ₹ 1469

7. From the following information determine-
   (*a*) The most economical order quantity and frequency of orders.
   (*b*) The reorder point.
   (*c*) The most economical order quantity if the cost of the item has increased to ₹ 4.50/unit from ₹ 1.50/unit.
      (*i*) Annual usage - 75,000 units.
      (*ii*) Usage per month is constant = 6250 units/month.
      (*iii*) Cost of a unit = ₹ 1.50
      (*iv*) Carrying cost = 20% of average inventory investment an annual basis.
      (*v*) Cost of placing an order and process the delivery = ₹ 18.
      (*vi*) Lead time – 45 days.
      (*vii*) Safety stock – 3,250 units.

Solution:

$$\text{Total carrying cost} = \frac{75,000 \times 1.5 \times 20}{100}$$

$$= 7500 \times 15 \times 20$$

$$= ₹\ 22500$$

$$\text{Carrying cost/unit} = \frac{22500}{75,000} = 0.30$$

(*a*)
$$EOQ = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 75,000 \times 18}{0.3}}$$

Notes

$$= \sqrt{2 \times 25,000 \times 180}$$

$$= \sqrt{50,000 \times 180}$$

$$= \sqrt{90,00,000}$$

$$= 3 \times 1000 = 3000 \text{ units.}$$

(*b*) Order point = (lead time × normal usage during lead time) + Safety stock

$$= (1.5 \text{ months} \times 6250) + 3250$$

$$= (9375) + 3250 = 12625 \text{ units.}$$

(*c*) EOQ if the cost of unit has increased to ₹ 4.5

$$\text{Total carrying cost} = \frac{75,000 \times 4.5 \times 20}{100}$$

$$= 75,000 \times 4.5/5$$

$$= 15000 \times 4.5 = ₹ 67500$$

$$\text{Carrying cost/unit} = \frac{67,500}{75000} = 0.9.$$

$$\text{EOQ} = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 75,0000 \times 18}{0.9}}$$

$$= \sqrt{2 \times 75,000 \times 20}$$

$$= \sqrt{1,50,000 \times 20}$$

$$= \sqrt{30,00,00}$$

$$= 1000\sqrt{3} = 1732 \text{ units.}$$

3.5. SUMMARY

- The term inventory refers to the stockpile of the products a firm is offering for sale and the components that make up the product.
- Raw material inventory contains items that are purchased by the firm from others and are converted into finished goods through the manufacturing/production process.
- The job of a financial manager is to reconcile the conflicting viewpoints of the various functional areas regarding the appropriate inventory levels in order to fulfil the overall objective of maximizing the owner's wealth.
- The basic responsibility of the financial manager is to make sure the firm's cash flows are managed efficiently. Efficient management of inventory should ultimately result in the minimization of the owner's wealth.

Notes

- One operating objective of inventory management is to minimise cost. Excluding the cost of merchandise.
- The second element in the optimum inventory decision deals with the benefits associated with holding inventory. The major benefits of holding inventory are the basic function of inventory.
- The maintenance of inventory also helps a firm to enhance its sales efforts.
- On the basis of cost involved, the various inventory items are, according to this system, categorised into following three classes.
    1. Class A
    2. Class B
    3. Class C
- The items included in class 'A' involve the largest investment.
- The class, 'c' consists of items of inventory which involve relatively small investment although the number of items is fairly large.
- The class 'B' stands midway. It deserves less attention than 'A' but more than 'C'. It can be controlled by employing less sophisticated techniques.
- ABC analysis is carried with an object of evolving a policy guidelines for selective materials control under the method.
- The EOQ technique determines the size of an order to acquire inventory so as to minimise the carrying as well as the ordering costs.
- The safety stock may be defined as the minimum additional inventory to serve as a safety margin or buffer or cushion to meet an unanticipated increase in usage resulting from an unusually high demand and or an uncontrollable late receipt of incoming inventory.

3.6. SELF-HELP QUESTIONS

1. What do mean inventory and why it, essential for all the firm? Explain with example.
2. Enumerate the objectives of the inventory management.
3. What is the purpose of safety stock? Explain the costs and benefits associated with safety stock?
4. What is the need of inventory control system? On what key premise is ABC system based? Explain the limitation of ABC inventory control system.
5. Define EOQ? How can it be computed? What are limitation of EOQ model? Explain with example.
6. Explain with example inventory order point and its determination?
7. From the following information find out EOQ?
    (*i*) Annual consumption – 5000 units
    (*ii*) Rate of/order during last year – 1000 units
    (*iii*) Production cost/unit – ₹ 12

Notes

(iv) Raw material and labour/ unit – ₹ 8

(v) Unit-₹ 4.

(vi) Ordering cost - ₹ 1500

(vii) Carrying cost - 20%.

8. A manufacturing company annually produces 1000 units at a cost of ₹ 4/unit . The industrial's differential costs of carrying the item in the finished goods inventory are 20% of the inventory value/year. The set-up costs/production run is ₹ 20% calculate the optimum production run?

9. (i) The annual usage – 30,000 units

(ii) Acquisition cost/order – ₹ 150.

(iii) Carrying cost/unit/year – ₹ 1.2

(iv) Order sizes

(a) 30,000 units

(b) 15,000 units

(c) 6,000 units

(d) 3,000 units

(e) 1500 units

(f) 750 units

Determine–(1) Order cost (2) Carrying cost (3) Average inventory (4) Economic order quantity.

10. From following data determine EOQ.

(i) Annual usage – 12,00,000 units

(ii) Purchase price/unit – ₹ 3.

(iii) Ordering cost/order – ₹ 50

(iv) Carrying cost – 10% of cost.

11. (a) From the following determine EOQ.

(i) List price of product – ₹ 800 per gross.

(ii) 40% trade discount is allowed on list price on purchases in gross lots.

(iii) Freight changes – ₹ 20/gross from transport company to the factory premises.

(iv) Annual consumption – 36 gross/year.

(v) Cost of placing order – ₹ 10

(vi) Cost of receiving order – ₹ 20.

(vii) Carrying cost – 20% of effective purchase price of goods.

(viii) Insurance taxes – 12% of net delivered cost of inventory.

(b) Determine the total annual cost of the inventory based on uniform order lot sizes of 1, 2, 3, 4, 5, and 6 gross of product.

(c) Determine the minimum stock and reorder point of the product when—

(i) Working days — 240 days

(ii) Safety stock —1 gross

(iii) Normal delivery time to received an order — 20 working days.

Notes

12. A product is sold in package of 12 units @ ₹ 20/package demand of the product is at a constant rate of 2,000 packages/month. The cost price/ package of the selling company is ₹ 10. The company requires a 3 days lead time from date of order to date of delivery. The ordering cost is ₹ 1.2/order. Carry cost is 10%/annum. Calculate–

(i) EOQ. (ii) No. of orders needed/year.

Unit–4

Notes

Receivables Management

Structure

4.1. INTRODUCTION

In depth examination of one of the most important components of current assets that is cash, it is observed that a basic strategy to reduce the operating cash requirement of a firm is to accelerate the collection of receivables so as to reduce the average collection period. The receivables represent an important component of the current assets of a firm.

4.2. OBJECTIVES

The term receivables is defined as "debt owned to the firm by customer arising from sale of goods or services in the ordinary course of business."

When a firm makes an ordinary sale of goods or services and does not receive payment, the firm grants trade credit and creates accounts receivable which could be collected in the future. Receivables management is also called trade credit management. Thus, accounts receivable represent an extension of credit to customers, allowing them a reasonable period of time in which to pay for the goods received.

The sale of goods on credit is an essential part of the modern competitive economic system. In fact, credit-sales and therefore receivables are treated as a marketing tool to aid the sale of goods. The credit sales are generally made on open account in the sense that there are no formal acknowledgement of debt obligations through a financial instrument.

As a marketing tool, they are intended to promote sales and thereby profits. However, extension credit involves risk and cost. Management should weigh the benefits as well as cost to determine the goal of receivables management.

The objective of receivables management is "to promote sales and profits until that point is reached where the return on investment in further funding receivables is less than the cost of funds raised to finance that additional credit *i.e.*, cost of capital."

The specific cost and benefit which are relevant to the determination of the objectives of receivables management are as below:

(*a*) Costs

(*b*) Benefits

4.2.1 Costs

The major categories of costs associated with the extension of credit and accounts receivable are

(*a*) Collection cost

(*b*) Capital cost

(*c*) Delinquency cost

(*d*) Default cost

4.2.1.1 Collection cost

These are the administrative costs incurred in collecting the receivables from the customers to whom credit sales have been made. Included in this category of cost are:

(*i*) Additional expenses on the creation and maintenance of a credit department with staff, accounting records, stationary, postage and other related items.

(*ii*) Expenses involved in acquiring credit information either through outside specialist agencies or by the staff of the firm itself.

Note: These expenses would not be incurred if the firm does not sell on credit.

4.2.1.2 Capital cost

The increased level of accounts receivable is an investment in assets. These have to be financed thereby involving a cost.

There is a time-lag between the sale of goods to and payment by the customers. Meanwhile, the firms have to pay employees and suppliers of raw materials, thereby implying that the firm should arrange for additional funds to meet its own obligations while waiting for payment from its customers. The cost on the use of additional capital to support credit sales, which alternatively could be profitably employed elsewhere, is, therefore, a part of the cost of extending credit or receivables.

4.2.1.3 Delinquency cost

This cost arises out of the failure of the customers to meet their obligation when payment on credit sales become due after the expiry of the credit period. Such costs are called delinquency costs. The important components of this cost are:

Notes

(*i*) Blocking-up of funds for an extended period.

(*ii*) Cost associated with steps that have to be initiated to collect the overdues such as reminders and other collection efforts, legal charges where necessary and so on.

4.2.1.4 Default cost

The firm may not be able to recover the overdues because of the inability of the customer. Such debts are treated as bad debts and have to be written off as these cannot be realized. Such costs are known as default costs associated with the credit sales and accounts receivables.

4.2.2 Benefits

Beside costs, another factor that has a bearing on accounts receivables management is the benefit emanating from credit sales.

Benefits are the increased sales and anticipated profits because of a more liberal policy. When firms extend trade credit, that is invest in receivables, they intend to increase the sales. The impact of a liberal trade policy is likely to take following two forms.

1. It is oriented to sales expansion, *i.e.*, growth oriented.
2. The firm may extend credit to protect its current sales against emerging competition. *i.e.*, sales retention.

Investment in receivables involves costs as well as benefits. The extension of trade credit has a major impact on sales, costs and profitability.

Other things being equal, a relatively liberal policy and therefore, higher investment in receivables will produce larger sales. However costs will be higher with liberal policies than with more stringent measures. Therefore, accounts receivable management should aim at a trade off between profit (benefit) and risk (cost).

The decision to commit funds to receivables or the decision to grant credit will be based on a comparison of the benefits and costs involved, while determining the optimum level of receivables.

Notes:

1. Costs and benefits to be compared are marginal costs and benefits means firms should only consider the increment *i.e.*, additional benefits and costs that result from a change in the receivables or trade credit policy.
2. Though it is true that general economic condition and industry practices have a strong impact on the level of receivables, a firm's investment in this type of current assets is also greatly affected by its internal policy.
3. A firm has little or no control over environmental factors, such as economic conditions and industry practices but it can improve its profitability through a properly conceived trade credit policy or receivables management.

Notes

4.3. CREDIT POLICIES

The firms objective with respect to receivables management is not merely to collect receivables quickly but attention should also be given to the benefit cost trade off involved in the various areas of accounts receivable management. The first decision area is credit policies.

The credit policy of a firm provides the framework to determine—

(*a*) whether or not to extend credit to a customer.

(*b*) how much credit to extend the credit policy decision of firm has two broad dimensions.

(*i*) Credit standards

(*ii*) Credit analysis

A firm has to establish and use standards in making credit decisions, develop appropriate sense of credit information and methods of credit analysis.

4.3.1 Credit Standards

The term credit standards represents the basic criteria for the extension of credit to customers. The quantitative basis of establishing credit standards are factors such as:

1. Credit rating
2. Credit references
3. Average payments periods
4. Certain financial ratios

Note: The above factors are not given due weightages while finding out the trade off between benefits and costs to the firm as a whole.

Following are the two major devisions of overall standards:

(*i*) Light or restrictive

(*ii*) Liberal or non-restrictive.

The trade-off with reference to credit standards cover.

(*a*) the collection cost

(*b*) the average collection period/investment in accounts receivable.

(*c*) level of bad debts losses.

(*d*) level of sales.

The above factors should be considered while deciding whether to relax credit standards or not of standards are relaxed, it means more credit will be extended while if standards are tightened less credit will be extended.

The implications of the four factors are as below:

4.3.1.1 Collection costs

The implications of relaxed credit standards are:

Notes

1. More credit
2. A bigger credit department to service accounts receivable and related matters.
3. Increased in collection cost.

The effect of tightening of credit standards will be exactly the opposite.

Notes:
1. These cost are likely to be semivariable, because upto a certain point the existing staff will be able to carry on the increased workload, but beyond that, additional staff would be required.
2. These are assumed to be included in the variable cost per unit and need not be separately identified.

4.3.1.2 Investments in receivables or the average collection period

The investment in accounts receivable involves a capital cost as funds have to be arranged by the firm to finance them till customers make payments.

Higher the average accounts receivable, the higher is the capital or carrying cost.

A change in the credit standards-relaxation or tightening leads to a change in the level of accounts receivable either.

(*a*) Through a change in sales

(*b*) Through a change in collection.

A relaxation in credit standards, implies an increase in sales which in turn, would lead to higher average accounts receivable. Further, relaxed standards would mean that credit is extended liberally so that it is available to even less credit-worthy customers who will take a longer period to pay overdues. The extension of trade credit to slow-paying customers would result in higher level of accounts receivables.

A tightening of credit standards would signify —

(*i*) a decrease in sales and lower average accounts receivable.

(*ii*) an extension of credit limited to more creditworthy customers who can promptly pay their bills and thus a lower average level of accounts receivable. Thus, a change in sales and change in collection period together with a relaxation in standards would produce a higher carrying costs while change in sales and collection period result in lower costs when credit standards are tightened. These basic reactions also occur when change in credit terms or collection procedures are made.

4.3.1.3 Bad debt expenses

Another factor which is expected to be affected by changes in the credit standards is bad debt default expenses. They can be expected to increase with relaxation in credit standards and decrease if credit standard become more restrictive.

4.3.1.4 Sales volume

Changing credit standards can also be expected to change the volume of sales. As the standards are relaxed, sales are expected to increase, conversely, a tightening is expected to cause a decline in sales.

Notes:
1. Sales volume increase with relax standards hence more is profit and vice versa.
2. Average collection period increases with relax standards hence less is profit as cost of collection and cost of capital goes up and vice versa.
3. Bad debts increases with relax standard leads to profit goes down and vice versa.

Example: A firm is currently selling a product @ 20 ₹/unit. The most recent annual sales (all credit) were 60,000 units. The variable cost per unit ₹ 120 and the average cost per unit given a sales volume of 60,000 units is ₹ 16. The total fixed cost is ₹ 1,20,000. The average collection period may be assumed to be 30 days.

The firm is contemplating a relaxation of credit standards that is expected to result in a 15% increase in unit sales, the average collection period would increase to 45 days with no change in bad debt expenses. It is also expected that increased sales will result in additional net working capital to the extent of ₹ 20,000. The increase in collection expenses may be assumed to be negligible. The required return on investment is 15%.

Should the firm relax the credit standard?

Solution:

Profit on incremental sales.

The profit on sales will increase by an amount equal to the product of the additional units sold and additional profit per unit.

Since the 60,000 units representing the current level of sales absorb all the fixed costs, any additional units sold will cost only the variable cost per unit. The marginal profit per unit will be equal to—

$$= \text{sales price/unit} - \text{variable cost/unit}$$
$$= 20 - 12 = ₹\ 8$$

The marginal profit/contribution margin/ unit will be ₹ 8.

The total additional (marginal) profits form incremental sales will be.

$$= 15\% \text{ of } 60{,}000 \times 8$$
$$= \frac{15}{100} \times 60000 \times 8 = 15 \times 600 \times 8 = 9000 \times 8$$
$$= ₹\ 72000 \quad \textbf{Ans.}$$

Cost of Marginal/Incremental Investment in Receivables

This cost can be computed by finding the difference between the cost of carrying receivables before and after the proposed relaxation in credit standard

Notes

(*i*) Turnover on accounts receivable

$$\text{Proposed plan} = \frac{\text{No. of days in year}}{\text{Average collection period}}$$

$$= 360/45 = 8.$$

$$\text{Present plan} = 360/30 = 12.$$

(*ii*) Total cost of sales.

$$\text{Present plan} = \text{No. of units} \times \text{cost/unit}$$

$$= 60{,}000 \times 16 = ₹\ 9{,}60{,}000$$

$$\text{Proposed plan} = (60{,}000 \times 16) + (9{,}000 \times 12)$$

$$= 9{,}60{,}000 + 1{,}08{,}000$$

$$= ₹\ 10{,}68{,}000$$

(*iii*) Average investment in accounts receivable

$$\text{Present plan} = 9{,}60{,}000/12 = ₹\ 80{,}000$$

$$\text{Proposed plan} = 10{,}68{,}000/8 = ₹\ 1{,}33{,}2{,}50$$

(*iv*) The cost of marginal investments in accounts receivable = average investment in proposed plan - average investment present plan

$$= 1{,}33{,}250 - 80{,}000 = ₹\ 53{,}250$$

$$\text{marginal investments} = ₹\ 53{,}250$$

Marginal investments means additional funds requirement to finance incremental accounts receivables *i.e.*, ₹ 53,250. When rate of return is 15%

$$\text{Cost} = \frac{53{,}250 \times 15}{100} = 532.50 \times 15$$

$$= ₹\ 6487.50 \text{ (opportunity cost)}$$

(*v*) Cost of working capital

$$= 20{,}000 \times 15\% = 200 \times 15 = ₹\ 3{,}000$$

In the above example,

Additional profits or increased sales as a result of relaxed credit standards (₹ 72,000) is more than the cost of incremental investment on accounts receivables ₹ 6487.50 and working capital ₹ 3,000.

Therefore firm can relax the credit standards to become more viable in the market.

4.3.2 Credit Analysis

Besides establishing credit standards, a firm should develop procedures for evaluating credit applicants. The second aspect of credit policies of a firm

Notes

is credit analysis and investigation. Two basic steps are involved in credit investigation process.

(*a*) Obtaining credit information

(*b*) Analysis of credit information.

On the basis of credit analysis that the decisions to grant credit to a customer as well as the quantum of credit would be taken.

4.3.2.1 Obtaining credit information

The first step in credit analysis is obtaining credit information on which to base the evaluation of a customer. The sources of information are

(*i*) External

(*ii*) Internal

(*i*) External

The availability of information from external sources to assess the credit worthiness of customers depends upon the development of institutional facilities and industry practices.

In India, the external sources of credit information are not as developed as in the industrially advanced countries of the world. Depending upon the availability the following external sources may be employed to collect information.

(*i*) Financial statements

(*ii*) Bank references

(*iii*) Trade references

(*iv*) Credit Bureau Reports

Financial Statements. One external source of credit information is the published financial statements that is the balance sheet, profit and loss a/c etc. The financial statements contain very useful information. They throw light or an applicants financial viability, liquidity, profitability and debt capacity.

Although the financial statements do not directly reveal the past payment records of the applicant, they are very helpful in assessing the overall financial position of a firm, which significantly determines its credit standing.

Bank References. Another useful source of credit information is the bank of the firm which is contemplating the extension of credit. The modus operandi here is that the firm's banker collects the necessary information from the applicant's banks.

Alternatively, the applicant may be required to ask his banker to provide the necessary information either directly to the firm or to its bank.

Trade References. These refer to the collection of information from firms with whom the applicant has dealing and on the basis of their experience would work for the applicant.

Credit-Bureau Reports. Finally, specialist credit bureau reports from organisations specialising in supplying credit information can also be utilised.

Notes

(ii) Internal

Usually firms require their customers to fill various forms and documents giving details about financial operations. They are also required to furnish trade reference with whom the firms can have contacts to judge the suitability of the customers for credit. This type of information is obtained from internal sources of credit information. Another internal source of credit information is derived from the records of firm contemplating an extension of credit. It is likely that a particular customer/applicant may have enjoyed credit facility in the past. In that case the firm would have information on the behaviour of the applicants in terms of the historical payment pattern. This type of information may not be adequate and may, therefore have to be supplemented by information from other sources.

4.3.2.2 Analysis of Credit Information

Once the credit information has been collected from different sources, it should be analysed to determine the credit worthiness of the applicant.

Although there are no established procedures to analyse the information, the firm should devise one to suit its needs.

The analysis should cover following two aspects —

(*a*) quantitative

(*b*) qualitative.

(a) Quantitative

The assessment of the quantitative aspects is based on the factual information available from the financial statements, the past records of the firm, and so on.

The 1st step involved in this type of assessment is to prepare an Aging schedule of the accounts payable of the applicant as well as calculate the average age of the accounts payable. This exercise will give an insight into the past payment pattern of the customer.

The next step in analysing the credit information is through a ratio analysis of the liquidity, profitability and debt capacity of the applicant. These ratio should be compared with the industry average.

Note: Trend analysis over a period of time would reveal the financial strength of the customer.

(b) Qualitative

The quantitative assessment should be supplemented by a qualitative/ subjective interpretation of the applicant's credit worthiness. The subjective judgement would cover aspects relating to the quality of management.

The references from other suppliers, bank references and specialist bureau reports would form the basis for the conclusions to be drawn.

In the ultimate analysis, therefore, the decision whether to extend credit to the applicant and what amount to extend will depend upon the subjective interpretation of his credit standing.

4.4. CREDIT TERMS

Notes

The second decision-area in accounts receivable management is the credit terms. After the credit standards have been established and the credit worthiness of the customers has been assessed, the management of a firm must determine the terms and conditions on which trade credit will be made available.

The stipulations under which goods are sold on credit are referred as credit terms. These relate to the repayment of the amount under the credit sale. Thus, credit terms specify the repayment terms of receivables.

Credit-terms have the following three components

(1) Credit period

(2) Cash discount

(3) Cash discount period.

4.4.1 Credit Period

The duration of time for which trade credit is extended, during this period the overdue amount must be paid by the customer.

4.4.2 Cash Discount

The overdue amount will be reduced by this and customer can take advantage of it by paying the overdue within the stipulated time.

4.4.3 Cash Discount Period

This refers to the duration during which the discount can be availed of. These terms are usually written in abbreviations.

Example. "3/7 net 30" stands for.

3 signifies the rate of cash discount *i.e.*, 3% which will be available to the customer if they pay the overdue with in stipulated time.

7 represents the time duration *i.e.*, 07 days with in which a customer must pay to be entitled to the discount.

30 means the maximum period for which credit is available and the amount must be paid is any case before the expiry of 30 days.

In other words, the abbreviation '3/7 net 30' means that the customer is entitled to 3% cash discount if he pays within 07 days after the beginning of the credit period 30 days. If however he does not want to take advantage of the discount and credit period, affect the trade off.

Note: Here focus in analysing the credit terms is from the view point of supplier of trade credit and not the recipients from whom it is a source of financing.

Notes

Cash Discount

The cash discount has implications for the sales volume, average collection period/average investment in receivables, bad debt expenses and profit per unit. In taking a decision regarding the grant of cash discount, the management has to see what happens to these factors if it initiates increase or decrease in the discount rate. The changes in the discount rate would have both +ve (positive) and –ve. (negative) effects.

The implications of increasing or initiating cash discounts are as below:

(1) The sales volume will increase. The grant of discount implies reduced prices. If the demand for the product is elastic, reduction in prices will result in higher sales volume.

(2) The customer would like to pay within the discount period to take the advantage of discount, the average collection period will be reduced. The reduction in the collection period will lead to a reduction in the investment in receivable *i.e.*, to the cost. As a result profit will increase.

(3) The discount will have a (– ve) negative effect on the profits. This is because the decrease in price would effect the profit margin/ unit of sale.

Effect of change in Cash Discount

Item	Change in discount	Effect on profit
Increase cash discount		
Sales volume	Increase	Increase
Average collection period	Decrease	Increase
Bad debt expenses	Decrease	Increase
Profit/ unit	Decrease	Decrease
Decrease cash discount		
Sales volume.	Decrease	Decrease
Average collection period	Increase	Decrease
Bad debt expenses	Increase	Decrease
Profit per unit	Increase	Increase

Example: XYZ Ltd., has annual credit sales amounting to ₹ 10,00,000 for which it grants a credit of 60 days. However, at present no discount policy is offered by the firm to its customers. The company is considering a plan to offer a discount "3/15 net 60". The offer of discount is expected to bring the total credit period from 60 days to 45 days and 50% of the customers (involve) are likely to avail the discount facility. The selling price of the product is ₹ 15 while the average cost per unit comes to ₹ 12.

Please advise the company to resort to discount facility if the rate of return is 20% and a month is equal to 30 days.

Solution:

	₹
Annual credit sales.	10,00,000
Present investment in receivable (A)	
(10,00,000 × 60/360 × 12/15)	1,33,333
Expected investment in receivable (B)	
(10,00,000 × 45/360 × 12/15)	1,00,000
Decrease in investment. (A – B)	33,333
Saving in capital cost	
33,333 × 20/100	6,667
Cash discount proposed to be allowed.	
(10,000,00 × 50/100 × 3/100)	15,000

Since saving of ₹ 6,667 on the capital cost is less than the cash discount of ₹ 15,000 proposed to be allowed, the firm should not offer the cash discount facility on the above terms.

It may however, consider the modification till the time capital cost saving exceed the cash discount allowed.

Credit Period. The second component of credit terms is the credit period. The expected effect of a change in the credit period are as below:

	Item	Direction of change	Effect on profit
(A)	**With increase in credit period.**		
	Sales volume	Increases	Increases
	Average collection period	Increases	decreases
	Bad debt expenses	Increases	decreases
(B)	**With decrease in credit period**		
	Sales volume	decreases	decreases
	Average collection period	decreases	increases
	Bad debt expenses.	decreases	increases

Example: A company currently has an annual turnover of ₹ 10 lakhs and an average collection period of 45 days. The company wants to experiment with a more liberal credit policy on the ground that increase in collection period will generate additional sales. From the following information kindly indicate which of the policies you would line the company to adopt and why.

Credit Policy	Increase in collection period	Increase in sales ₹	% of default
1	15 days	50,000	2%
2	30 days	80,000	3%
3	40 days	1,00,000	4%
4	60 days	1,25,000	6%

Notes

The selling price of the product is ₹ 5, average cost/unit at current level is ₹ 4, the variable cost/unit is ₹ 3, current bad debt loss is 1% and the required rate of return an investment is 20%. 360 days = 1 year.

Solution:

Evaluation of Credit Policies

Credit policy	Existing	Proposed			
(collection period in days)	45	60	75	85	105
	(₹)	(₹)	(₹)	(₹)	(₹)
Expected sales.	10,00,000	10,50,000	10,80,000	11,00,000	11,25,000
Expected additional sales.	–	50,000	80,000	1,00,000	1,25,000
Contribution an additional sales @ 40% $\left(\frac{(5-3)}{5} \times 100\right)$					
On Sales (A) Bad debts.	–	20,000	32,000	40,000	50,000
Expected sales × % of default	10,000	21,000	32,400	44,000	67,500
Additional bad debts (B)	–	11,000	22,400	34,000	57,500
Contribution of additional sales-additional bad debts (C) (A – B)	–	9,000	9,600	6,000	(–) 7500
Average receivables (Expected sales/360 × credit period)	1,25,000	1,75,000	2,25,000	2,54,722	3,28,125
Investment is receivables at variable cost. Receivables × $\left(\frac{\text{variable cost/unit}}{\text{selling price/unit}}\right)$	75,000	1,05,000	1,35,000	1,55,833	1,96,875
Incremental investment in receivables	–	30,000	60,000	80,833	1,21,875
Required return on additional investment in receivable @ 20% (D)	–	6,000	12,000	16,167	24,375
Excess of additional contribution over required return an additional investment in receivable (C – D)	–	3,000	(–) 2400	(–) 10167	(–) 31,875

Recommendation

The additional contribution over required return on additional investment in receivables is (+ve) positive under credit policy 1 only. Hence policy no. 1 that is extension of credit up to 60 days is recommended for adoption by the company.

Notes:

1. In practice, it may not be possible to discriminate among various customers while granting credit if their credit worthiness has been established.
2. Discrimination may be possible in respect to products. Credit may not be granted in the case of products which sell fast and the margins are rather low. On the contrary, credit would be necessary in the case of those products which have yet to capture the market.

4.5. COLLECTION POLICIES

The third area involved in the accounts receivables management is collection policies. These refer to the procedures followed to collect accounts receivable when, after the expiry of credit period, they become due. These policies cover two aspects which are as below:

(*i*) degree of efforts to collect the overdues.

(*ii*) type of collection efforts.

4.5.1 Degree of Collection Effort

To understand the effect of collection effort, the credit polices of a firm may be categorised into (*a*) strict/tight (*b*) lenient.

The collection policy would be tight if very vigorous procedures are followed. A tight collection policy has implications which involve benefits as well as costs. The management has to consider a trade off between these. Likewise, a lenient collection effort also affects the cost-benefit trade-off. The effect of tighten the collection are as below—

1. The bad debt expenses *i.e.*, default cost would decline.
2. Average collection period will be reduced.
3. Firm will benefit and its profit will increase.
4. A very rigorous collection strategy would involve increased collection costs.
5. May lead to decline in sales volume.

Example: A firm is contemplating stricter collection policies. The following details are available.

1. At present the firm is selling 36,000 units on credit at a price of ₹ 32 each, the variable cost per unit is ₹ 25 while the average cost/ unit is ₹ 29, average collection period is 58 days and collection expenses amount to ₹ 10,000, bad debts are 3%.
2. If the collection procedures are tightened, additional collection charges amounting to ₹ 20,000 would be required, bad debt will be 1% the collection period will be 40 days. Sales volume is likely to decline by 500 units.

   Assuming a 20% rate of return on investments, what would be your recommendation? Should the firm implement the decision?

Notes

Solution:

	₹
(*i*) **Bad debt expenses**	
Present plan (0.03 × 11,52,000)	34,560
Proposed plan (0.01 × 11,36,000)	11,360
Saving in Bad debt expenses—	23,200

(*ii*) **Average collection period/average**

Investment in receivables

$$\text{Present Plan} = \frac{36,000 \times 29}{360/58}$$

$$= \frac{36,000 \times 29 \times 58}{360} = 100 \times 29 \times 58 = ₹\ 1,68,200.$$

$$\text{Proposed Plan} = \frac{(36,000 \times 29) - (500 \times 25)}{360/40}$$

$$= \frac{(36000 \times 29) - (500 \times 25) \times 40}{360}$$

$$= \frac{(36,000 \times 29) - (500 \times 25)}{9}$$

$$= \frac{10,44,000 - 12,500}{9}$$

$$= 10,31,500/9 = ₹\ 1,14,611$$

Savings in average investment = 1,68,200 - 1,14,611 = ₹ 53,589

Assuming 20% rate of return then.

Firm will earn (opportunity cost) = $\frac{53589 \times 20}{100}$ = ₹ 10718

(*iii*) **Sales volume :** Since the sales volume will decline by 500 units. There would be a loss of ₹ 3,500 (500 × 7)

(*iv*) **Additional collection charges** = ₹ 20,000

Thus, the total benefits, from a tightening of collection policy will be (23,200 + 10718) = ₹ 33,918. The total cost will be (3,500 + 20,000) = ₹ 23,500. Therefore there would be a net gain of ₹ (33,918 – 23,500) = ₹ 10,418. Hence, firm should implement the proposed strategy.

4.5.2 Types of Collection Efforts

The second aspect of collection policies relates to the steps that should be taken to collect overdues from the customers.

A well developed/established collection policy should have clear-cut guidelines as to the sequence of collection efforts.

After the credit period is over and payment remain due the firm should initiate measures to collect them. The efforts should in the beginning be polite, but, with the passage of time, it should gradually become strict.

The steps usually taken are–

1. Letters, including reminders to expedite payment.
2. Telephone calls for personal contact.
3. Personal visits.
4. Help of collection agencies
5. Legal action.

Note: The firm should take recourse to very stringent measures like legal action, only after all other avenues have been fully exhausted. These not only involve a cost but also affect the relationship with the customers. The aim should be to collect as early as possible, genuine difficulties of the customers should be given due consideration.

4.6. ILLUSTRATIONS

1. A company has a present annual sales level of 10,000 units at ₹ 300/unit. The variable cost is ₹ 200/unit and fixed cost amount to ₹ 3,00,000/annum. The present credit period allowed by the company is 1 month.

   Company is considering a proposal to increase the credit period to 2 months and 3 months and has made the following estimates—

Particulars	Existing	Proposal	
		1	2
Credit period (month)	1	2	3
Increase in sales (%)	–	15	30
Bad debts (%)	1	3	5

   There will be an increase in fixed cost by ₹ 50,000 on account of increase in sales beyond 25% of present level. Company plans a pre-tax return of 20% on investment in receivables.

   From the above data asacertain the most suitable credit policy for the company and justify your answer.

Solution:

Decision Making–

Particulars	1 month	2 months	3 months
Sales (units)	10,000	11,500	13,000
Sales revenue (₹)	30,00,000	34,50,000	39,00,000
(less) variable costs	20,00,000	23,00,000	26,00,000
Total contribution (less) other costs	10,00,000	11,50,000	13,00,000
Fixed costs	3,00,000	3,00,000	3,00,000

Notes

Bad debts	30,000*	1,03,500**	1,95,000***
Investments	38,333****	86,667*****	1,47,500******
Profit	6,31,667	6,59,833	6,07,500

Working notes :

* 1% of 30,00,000 = 30,000

** 3% of 34,50,000 = 1,03, 500

*** 5% of 39,00,000 = 1,95,000

Investment in debtors (Ve + Fc)/ debtors turn over

**** 23,00,000/12 = ₹ 1,91,667

Cost of investment = 1,91,667 × 20/100

= ₹ 38,333

***** 26,00,000/6 = 4,33,333

Cost of investment = 4,33,333 × 20/100

= ₹ 86,667

****** 29,50,000/4 = 7,37,500

Cost of investment = 7,37,500 × 20/100

= ₹ 1,47,500

2. A unit of Godrej company has an annual sale of 24,00,000 of a particular product. The selling price of it/unit is ₹ 10. The variable cost is 70% of selling price. The require return on investment is 20% average cost per unit is ₹ 9, annual collection expenditure is ₹ 50,000. The default is 3% credit term is 2 months time.

   Godrej company is planning to change the credit policy. There are following two options.

Particulars	Options	
	1	2
Average collection period in months	1.5	1
Annual collection expenses (₹)	75,000	1,50,000
Percentage of default	2	1

Ascertain which option is better for the company and why.

Solution:

Evaluation of options 1 & 2

Particulars	Existing	Option 1	Option 2
Cost of operation			
Annual collection exp	50,000	75,000	1,50,000
Loss as default on 24,00,000	72,000	48,000	24,000
Cost of investment in debt	72,000*	54,000**	36,000***
Total	1,94,000	1,77,000	2,10,000

Working note:

Investment in debt (2,40,000 × 7) + (2,40,000 × 2)

= (16,80,000) + (4,80,000)

= ₹ 21,60,000 *

*** Existing.** 21,60,000/6 = 3.6 lakh.

Required return rate 20%

Cost of investment = ₹ 3.6 × 20/100 = ₹ 72,000

**** Option 1** 21,60,000/8 = 2.7 lakh.

Required return rate = 20%

Cost of investment = ₹ 2.7 × 20/100 = ₹ 54,000

***** Option 2** 21,60,000/12 = 1.8 lakh.

Required return rate = 20%

Cost of investment = ₹ 1.8 × 20/100 = ₹ 36,000

Interpretation

From the above calculation it is formed out that—

(*i*) Annual expenditure of collection is maximum is option 2.

(*ii*) Losses due to bad debt are maximum in the existing system.

(*iii*) The total cost of operation in all the three *i.e.*, existing, option 1 and option 2 is minimum in option 1.

Hence Godrej company should go for the option 1.

3. Following information about a company are available–

(*a*) Total sales are in credit.

(*b*) Company does not offer any cash discount.

(*c*) But company is planning to introduce at cash discount of 2% for payment within 10 days.

(*d*) The average collection period of company is 60 days.

Notes

Notes

(e) The annual sale is 2,00,000 units.

(f) Selling price is ₹ 30/unit.

(g) Variable cost/unit is ₹ 20.

(h) Average cost per unit is ₹ 25 at the current sales volume.

(i) Change in credit terms may increase the sales up 2,25,000 units.

(j) The average collection period may decrease to 45 days.

(k) To meet the increased sales an additional working capital of ₹ 1,00,000 is required.

(l) 50% sales on cash discount (assumed).

(m) Rate of return required is 20%.

Calculate and suggest whether the discount policy is feasible for the company or not. Justify.

Solution:

Effect of extending cash discount to customers

Particulars	Amounts (₹)
Increase in sales revenue	
(2,25,000 – 2,00,000) × 30 = 25,000 × 30	7,50,000
(–) variable cost 25,000 × 20	5,00,000
Incremental contribution –	2,50,000
(+) Savings in investment in debtors*	29,167
(–) cost of additional working capital (1,00,000 × 20/100)	20,000
(–) cost involved in cash discount (20/100 × 2,25,000 × 30 × 0.5)	67,500
Profit	1,91,667

Working notes*

$$\text{Present investment in debtors} = \frac{2,00,000 \times 25}{6(360/60)}$$

$$= \frac{2,00,000 \times 25}{6 \times 6}$$

$$= ₹\ 8,33,333$$

$$\text{Expected investment in debtors} = \frac{2,00,000 \times 25 + 25,000 \times 20}{8(360/45)}$$

$$= \frac{50,00,000 + 5,00,000}{8(360/45)}$$

$$= 55,00,000/8 \times 8 = ₹\ 6,87,500$$

Hence, decrease in investment on debtors

$$= ₹\ 8,33,333 - 6,87,500$$

$$= ₹\ 1,44,833$$

Saving in cost = 1,44,833 × 0.20

= ₹ 29,167

Interpretation

The above calculation reveals that when discount policy is adopted the profit is increased by ₹ 1,19,667 to the organisation. Hence, it is advised that firm should go for the discount system.

Notes

4. M/s CMC Ltd. manufactures computer components. The sales of the company on an average is 400 units/per annum. The selling price is ₹ 1000/unit. The variable cost/unit is ₹ 800. The credit period extended to customers is one month.

   Company is planning to extend this credit period to 2 months with the following expectations

   (*a*) There will be an increase is sales by 25%

   (*b*) Stock will be increased by ₹ 2,00,000

   (*c*) Creditors will be increased by ₹ 1,00,000.

   Advise to company whether it should go for extension of credit term or not if–

   (*i*) all customers avail of the extended credit period of 2 months.

   (*ii*) existing customers do not avail the new credit term but only the new customers avail it.

   Assume – The entire increase in sale is due to new customers and rate of return is 40%.

Solution:

(*i*) Effect of extend credit term to 2 months.

Particulars	**Amount (₹)**
Incremental sales revenue $\left(400 \times \frac{25}{100} \times 12 \times 1000\right)$	12,00,000
(–) increased variable costs (12,00,000 × 0.80)	9,60,000
Incremental Contribution	2,40,000
(–) Cost of additional working capital*	2,32,000
Incremental profit.	8,000

Working notes – *

(A) Present investment in debtors

$= \frac{400 \times 12 \times 800}{12} =$ ₹ 3,20,000

(B) Proposed investment in debtors.

$= \frac{500 \times 12 \times 800}{6} =$ ₹ 8,00,000

Notes

Additional investment in debtors – (B – A)	
= 8,00,000 – 3,20,000 =	₹ 4,80,000
(+) increase in stock –	₹ 2,00,000
(–) increase in creditors –	₹ 1,00,000
Additional requirement of Working capital	₹ 5,80,000
Rate of return = 40/100	
Cost of additional working capital 5,80,000 × 40/100 =	₹ 2,32,000

(ii) Effect of relaxation of credit period to 2 months.

Particulars	**Amount (₹)**
Incremental contribution	2,40,000
(–) Cost of additional working capital**	1,04,000
Incremental profit	₹ 1,36,000

Working notes—**

Additional investment in debt (100 × 12 × 800/6)	1,60,000
(+) increase is stock	2,00,000
(–) increase in creditors	1,00,000
	2,60,000
Cost of addition working capital (2,60,000 × 40/100)	₹ 1,04,000

Interpretation. As the above calculation indicates that there is an increase in profit by ₹ 8,000/annum. Hence it can be implemented. This policy will be more viable it second option that is only new customers avail the extended credit term facility is implemented.

5. From the following data of a company, evaluate all the given options and advise to the company with justification which option is better and why?

1. Present sales/annum is ₹ 2.4 lakhs.
2. Present credit period is one month– (30 days)
3. Contribution to volume/profit ratio is 33.33%
4. Company expects a pretax return of 20% on investment.
5. Option

Proposed increase in credit period beyond 30 days	Increase is normal sales (₹)
15 days.	12,000
30 days.	18,000
45 days.	21,000
60 days.	24,000

Hint – assume 360 days/year.

Solution:

Effect of extending credit period to customers: (in lakh ₹).

Particulars	Credit period				
	30 days	45 days	60 days	75 days	90 days
Sales	2.40	2.52	2.58	2.61	2.64
Varibale cost (2/3)	1.60	1.68	1.72	1.74	1.76
Contribution (A)	0.80	0.84	0.86	0.87	0.88
(–) cost of investment in (B) Debtors at variable costs.*	0.027	0.042	0.057	0.073	0.088
Profit (A – B)	0.773	0.798	0.803	0.7975	0.792

Working notes*

Cost of investment in debtors at variable cost for 30 days. Credit period turnover are 12

then $\frac{V_c}{12} \times 20/100 = \frac{1.6}{12} \times .20 = 0.027$

For 45 days – turnover are 8

then $\frac{V_c}{8} \times 20/100 = \frac{1.68}{8} \times .20 = 0.798$

For 60 days – turnover are 6.

then $\frac{V_c}{6} \times 0.20 = \frac{1.72}{6} \times 0.20 = 0.803$

For 75 days – turn over are 4.8.

then $\frac{V_c}{4.8} \times 0.20 = \frac{1.74}{4.8} \times 0.20 = 0.7975$

For 90 days. – turnover are 4.

then $\frac{V_c}{6} \times 0.20 = \frac{1.76}{4} \times 0.20 = 0.792$

Interpretation

The above calculation reveals that when 60 days of credit period is made that an extention of 30 days from existing 30 days. The profit is maximum.

Hence company is advised to opt for the 2nd option where sales are increasing by ₹ 18,000 and profit is 0.803. **Ans.**

Notes

4.7. SUMMARY

- The term receivables is defined as "debt owned to the firm by customer arising from sale of goods or services in the ordinary course of business."
- The specific cost and benefit which are relevant to the determination of the objectives of receivables management are as below:
  (*a*) Costs
  (*b*) Benefits
- The major categories of costs associated with the extension of credit and accounts receivable are
  (*a*) Collection Cost
  (*b*) Capital Cost
  (*c*) Delinquency Cost
  (*d*) Default cost
- The firms objective with respect to receivables management is not merely to collect receivables quickly but attention should also be given to the benefit cost trade off involved in the various areas of accounts receivable management.
- A firm has to establish and use standards in making credit decisions, develop appropriate sense of credit information and methods of credit analysis.
- The term credit standards represents the basic criteria for the extension of credit to customers.
- A relaxation in credit standards, implies an increase in sales which in turn, would lead to higher average accounts receivable.
- The second decision-area in accounts receivable management is the credit terms.
- The cash discount has implications for the sales volume, average collection period/average investment in receivables, bad debt expenses and profit per unit.
- The third area involved in the accounts receivables management is collection policies. These refer to the procedures followed to collect accounts receivable when, after the expiry of credit period, they become due.

4.8. SELF-HELP QUESTIONS

1. Explain credit standards? What are different variables which are to be considered while evaluating the possible changes in credit standards?
2. Define credit terms? What are the expected effects of
   (*a*) a decrease in cash discount
   (*b*) a decrease in credit period.
3. What are the collection policies? How these can be evaluated?

Notes

4. Write a note on objectives of receivable management.
5. Following informations in respect to a company are available.
   (*i*) Current sales – 3,00,000 units
   (*ii*) Selling price – ₹ 3/ unit.
   (*iii*) Current credit period – 30 days.
   (*iv*) Proposed credit period – 60 days.
   (*v*) Average receivable age – 40 days.
   (*vi*) Bad debts 0.5%
   (*vii*) Variable cost/unit – ₹ 2.30.
   (*viii*) Average cost/unit – ₹ 2.60.
   (*ix*) Expected change is sales – 40,000 units
   (*x*) Bad debts (expected) – 2%
   (*xi*) Expected average collection period – 72 days.
   (*xii*) Rate of return on capital – 18%

   Calculate and advise to company whether proposal of increase in credit period is viable or not.
6. A company has a very liberal credit policy till now and wants to change it to a more strict policy. Company presently sales 1,44,000 units @ ₹ 32/unit. Bad debt expenses are 3%, collection expenditure is ₹ 40,000/annum. The average collection period is 58 days. The variable cost/unit is ₹ 25 and average cost/unit is ₹ 29.

   With an additional expenses -on collection by ₹ 30,000 it is expected that bad debts will be reduced to 1%. The average collection period will become 40 days, sales will be effected and will reduce by 2000 units. If cost of capital (rate) is 20% what advise would you give to company?
7. The annual sales of EVER Ltd. is ₹ 7,80,000 credit period is 60 days. With the new credit policy it is expected that increase in sales to ₹ 10,00,000 and increase in credit period is 72 days.

   Selling price/unit is ₹ 25, Vc/unit is ₹ 12, Average cost/unit of 7,80,000 sales volume is ₹ 17. Calculate
   (*a*) Average accounts receivable in present and proposed plans.
   (*b*) Average cost/unit in proposed plan.
   (*c*) Marginal investments in accounts receivable resulting from proposed change.
   (*d*) Cost of marginal investment if the rate of return is 15%

   (**Hint.** There are 360 days in a year).
8. Credit sales of a company is Rs 32,00,000/annum

   Sales price/unit – ₹ 40.

   Variable cost/unit – ₹ 25.

   Average cost/unit – ₹ 32.

   Average age of a/cs – 72 days

Notes

Firm is planning to tighten the credit standards

Decrease is sales volume – 28,00,000.

Average age of receivable is expected to – 45 days.

Rate of return is 20%

Calculate the feasibility of the change in credit stand and from 72 days to 45 days.

9. XYZ Co. Ltd. presently sells 2000 units/annum. @ ₹ 100/unit. Variable cost/unit is ₹ 88, average cost/unit at current sales volume is ₹ 92. Average collection period is 36 days and all the sales are in credit.

   A relaxation in credit policy is expected to increase sales by 10% and average credit period to 60 days. If 15% is the rate of return company should go for relaxation in credit policy or not.

Unit–5

Cash Management

Notes

Structure

5.1. TREASURY MANAGEMENT

Once viewed as a peripheral activity conducted by back-office, today plays a very vital role in corporate management. It can be defined in many ways.

The Association of Corporate treasures defines — "Treasury Management as the efficient management of liquidity and financial risk in business." All firms to some degree are involved in treasury management, although in smaller companies, it may not be separately defined job.

Treasury management is responsible for—

1. Management of cash while obtaining the optimum return from any surplus funds.

Notes

2. Management of exchange rate risks in accordance with group policy.
3. Providing both long and short term funds for the business at minimum cost.
4. Maintaining good relationships with bank and other providers of finance including shareholders.
5. Advising an aspects of corporate finance including capital structure, mergers and acquisitions.

5.2. FUNCTIONS OF TREASURY DEPARTMENT

Following are the main functions of treasury department

(*a*) Cash management

(*b*) Currency management

(*c*) Funding management

(*d*) Banking

(*e*) Corporate finance

5.2.1 Cash Management

The efficient collection and payment of cash both inside the group and to third parties to the function of treasury department. The involvement of the department with the detail of receivables and payment/payables will be a matter of policy. There may be complete centralization within a group treasury or the treasury may simply advise subsidiaries and divisions on policy *i.e.*, collection, payment periods, discounts etc. Any position between these two extremes would be possible. Treasury will normally manage surplus funds in an investment portfolio. Investment policy will consider future need for liquid funds and acceptable levels of risk as determined by company policy.

5.2.2 Currency Management

The treasury department manage the foreign currency risk exposure of the company. In a large MNC (multinational company) the first step will usually be to set off intra-group indebtedness. The use of matching receipts and payments in the same currency will save transaction costs. Treasury might advise on the currency to be used when invoicing overseas sales.

The treasury will manage any net exchange exposures in accordance with company policy. If risks are to be minimised then forward contract can be used either to buy or sell currency forward.

5.2.3 Funding Management

Treasury department is responsible for planning and servicing the company's short, medium and long-term cash needs. Treasury department will also participate in the decision on capital structure and forecast future interest and foreign currency rates.

Notes

5.2.4 Banking

It is important that a company maintains a good relationship with its bankers. Treasury department carry out negotiations with bankers and act as the initial point of contact with them. Short-term finance can come in the form of bank loans or through the sale of commercial papers in the money market.

5.2.5 Corporate Finance

Treasury department is involved with both acquisition and divestment activities within the group. In addition it will often have responsibility for investor relations. The latter activity has assumed increased importance in markets where share-price performance is regarded as crucial and may affect the company's ability to undertake acquisition activity or, if the price falls drastically render it vulnerable to a hostile bid.

5.3. MANAGEMENT OF CASH

Management of cash is an important function of finance manager. The modern day business comprises of numerous units spread over vast geographical areas. It is the duty of finance manager to provide adequate cash to each of the units. For the survival of the business it is absolutely essential that there should be adequate cash. It is the duty of the finance manager to have liquidity at all parts of the organisation while managing cash.

On the other hand, he has also to ensure that there are no funds blocked in idle cash. Idle cash resources entail a great deal of cost in terms of interest charges and in terms of opportunity/ opportunities costs. Hence, the question of costs of idle cash must be kept in mind by the finance Manager. A cash management scheme, therefore, is a delicate balance between the twin objectives of liquidity and costs.

5.4. OBJECTIVES OF CASH MANAGEMENT

The basic objectives of cash management are two folds.

(*a*) to meet the cash disbursement needs *i.e.*, payment schedule.

(*b*) to minimise funds committed to cash balances.

Note: These are conflicting and mutually contradictory and the task of cash management is to reconcile them.

5.4.1 Meeting Payments Schedule

In the normal course of business, firms have to make payments of cash on a continuous and regular basis to suppliers of goods, employees and so on. At the same time, there is a constant inflow of cash through collections from debtors. Cash is, therefore, aptly described as the "oil to lubricate the ever-turning wheels of business, without it the process grind to a stop".

Notes

A basic objective of cash management is to meet the payment schedule, that is to have sufficient cash to meet the cash disbursement needs of a firm.

The importance of sufficient cash to meet the payment schedule can hardly be over emphasized. The advantages of adequate cash are:

1. It prevents insolvency or bankruptcy arising out of the inability of a firm to meet its obligations.
2. The relationship with the bank is not strained.
3. It helps in fostering good relations with trade creditors and suppliers of raw materials, as prompt payment—may help their own cash management.
4. A cash discount can be availed of if payment is made within due date.
5. It leads to a strong credit rating which enables the firm to purchase goods on favourable terms and to maintain its line of credit with banks and other services of credit.
6. To take advantage of favourable business opportunities that may be available periodically.
7. The firm can meet unanticipated cash expenditure with a minimum of strain during emergencies like strikes, fires or a new marketing campaign by competitors.

Notes: 1. Keeping large cash balances, however, implies a high cost.

2. The advantage of prompt payment of cash can well be realised by sufficient and not excessive cash.

5.4.2 Minimising Funds Committed to Cash Balances

The second objective of cash management is to minimise cash balances. In minimising the cash balances, two conflicting aspects have to be reconciled.

A high level of cash balances will ensure prompt payment together with all the advantages. But, it also implies that large funds will remain idle, as cash is a non-earning asset and firm will have to forego profits.

A low level of cash balances, on the other hand, may mean failure to meet the payment schedule. The aim of cash management, therefore should be to have an optimal amount of cash balances.

5.5. FACTORS DETERMINING CASH NEEDS

The factors that determine the required cash balance are

(*a*) Synchronization of cash flow

(*b*) Short costs

(*c*) Excess cash balance cost

(*d*) Procurement and management

(*e*) Uncertainty

Notes

5.5.1 Synchronisation of Cash Flows

The need for maintaining cash arises from the non-synchronisation of the inflows and outflows of cash. If the receipts and payments of cash perfectly coincide or balance each other, there would be no need for cash balance.

The first consideration in determining the cash need is therefore, the extent of non-synchronisation of cash receipts and disbursements. In this respect, inflows and outflows have to be forecast over a period of time, depending upon the planning horizon, which is typically a one year period with each of the 12 months being a sub period. The technique adopted is a cash budget.

5.5.2 Short Costs

Another general factor to be considered in determining cash needs is the cost associated with a shortfall in the cash needs. The cash forecast presented in the cash budget would reveal periods of cash shortages. In addition, there may be some unexpected shortfall. Every shortfall of each-whether expected or unexpected —involve a cost 'depending upon the severity, duration and frequency of the shortfall and how the shortage is covered. Expenses incurred as a result of shortfall are called short cost. Short costs include the followings:

(*i*) Transaction cost

(*ii*) Borrowing costs

(*iii*) Loss of cash discount

(*iv*) Cost associated with deterioration of credit rating

(*v*) Penalty rates

5.5.2.1 Transaction cost

It is associated with raising cash to tide over the shortage. This is usually the brokerage incurred in relation to the sale of some short-term near cash assets such as marketable securities.

5.5.2.2 Borrowing costs

It is associated with borrowing to cover the shortage and includes interest on loan, commitment charges and other expenses relating to the loan.

5.5.2.3 Loss of cash Discount

It is a substantial loss because of a temporary shortage of cash.

5.5.2.4 Cost associated with deterioration of credit rating

It reflected in higher bank charges on loans, stoppage of supplies, demands for cash payment, refusal to sell, loss of image and the attendant decline in sales and profits.

Penalty rates. It is charged by banks to meet a shortfall is compensating balances.

Notes

5.5.3. Excess Cash Balance Costs

The cost of having excessively large cash balances is known as the excess cash balance cost. If large funds are idle, the implication is that the firm has missed opportunities to invest those funds and has thereby lost interest which it would otherwise have earned. This loss of interest is primarily the excess cost.

5.5.4 Procurement and Management

These are the cost associated with establishing and operating cash management staff and activities. They are generally fixed and are mainly accounted for by salary, storage, handling of securities etc.

5.5.5 Uncertainty and Cash Management

Finally, the impact of uncertainty on cash management strategy is also relevant as cash flows cannot be predicted with complete accuracy. The first requirement is a precautionary cushion to cope with irregularities in cash flows, unexpected delays in collections and disbursements, defaults and unexpected cash needs.

The impact of uncertainty on cash management can however be mitigated through—

(*i*) Improved forecasting of tax payments, Capital expenditure, and dividents etc.

(*ii*) Increased ability to borrow through overdraft facility.

5.6. DETERMINING CASH NEEDS

There are two approaches to derive an optimal cash balance. These are

(*a*) Minimising cost cash models

(*b*) Cash budget

5.6.1 Cash Management Models

In the recent years several types of mathematical models have been developed which helps to determine the optimum cash balance to be carried by a business organisation.

The purpose of all these models is to ensure that cash does not remain idle unnecessarily and at the same time the firm is not confronted with a situation of cash shortage.

All these models can be put in two categories *i.e.*,

(*i*) Inventory models

(*ii*) Stochastic models

Inventory type models have been constructed to aid the finance manager to determine optimum cash balance of his firm. William J. Baumal's Economic order quantity model applies equally to cash management problems.

However, in a situation where EOQ model is not acceptable, stochastic model of cash management helps in determining the optimum level of cash balance. It helps only when the demand for cash is stochastic and not known in advance.

Notes

5.6.1.1 William J. Baumal's economic order quantity model

According to this model, optimum cash level is that level of cash where the carrying costs and transaction costs are the minimum.

The carrying costs refers to the cost of holding cash, namely, the interest foregone on marketable securities.

The transaction costs refers to the cost involved in getting the marketable securities converted into cash. This happens when the firm falls short of cash and has to sell the securities resulting in clerical, brokerage, registration and other costs.

The optimum cash balance according to this model will be at that point where these two costs are equal.

$$C = \sqrt{\frac{2U \times P}{S}}$$

where C = Optimum cash balance

U = Annual or monthly cash disbursement

P = Fixed cost per transaction

S = Opportunity cost of one rupee p.a. or p.m.

Example: A firm maintains a separate account for cash disbursement. The total disbursements are ₹ 1,05,000 p.m. or ₹ 12,60,000 p.a. Administrative and transaction cost of transferring cash to disbursement a/c is ₹ 20 per transfer. Marketable securities yield is 8% p.a. determine optimum cash balance with EOQ model.

Solution: Given U = ₹ 12,60,000

P = ₹ 20%

S = 8% or 0.8

then

$$C = \sqrt{\frac{2UP}{S}} = \sqrt{\frac{2 \times 12,60,000 \times 20}{0.8}}$$

$$= \sqrt{\frac{5,04,00,000}{0.8}} = \sqrt{6,30,00,000}$$

$$= 7937.25 \approx ₹ 7937$$

5.6.1.2 Miller-on cash management model

According to this model the net cash flow is completely stochastic. When changes in cash balance occur randomly the application of control theory serves a useful purpose. Miller-On model is one of such control limit model.

Notes

This model is designed to determine the time and size of transfers between an investment a/c and cash *a/c*.

In this model control limits are set for cash balances. These limits are '*h*' as upper limit, '*z*' as the return point, '0' zero as the lower limit.

When the cash balance reaches to upper limit, the transfer of cash equal to $(h - z)$ is invested in marketable securities a/c when it touches the lower limit, a transfer from marketable securities a/c to cash a/c is made.

During the period when cash balance stays between (w, z) and $(z, 0)$ *i.e.*, high and low limits of cash balance are set up on the basis of fixed cost associated with the securities transactions, the opportunity cost of holding cash and degree of likely fluctuations in cash balances.

These limits satisfy the demand for cash at the lowest possible total lost.

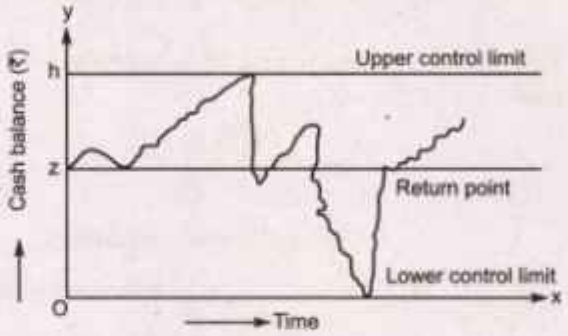


Fig. 5.1:

This model determines the optimum cash balance level which minimises the cost of cash management.

$$C = \frac{bE(N)}{t} + iE(M)$$

where
- b = the fixed cost per conversion
- $E(M)$ = expected average daily cash balance
- $E(N)$ = expected number of conversions
- t = number of days in the period
- i = lost opportunity cost
- C = total cash management cost
- z = return point = $\sqrt[3]{\frac{2br^2}{4i}}$

where
- b = fixed cost per conversion
- r^2 = the variance of daily changes in Cash balances.
- h = upper limit = $3z$

Further, the financial manager could consider the use of less liquid, potentially more profitable securities as investments for the cash balances in excess of '*h*'.

These is another model of cash management known as *Orgler's Model*.

According to this model, an optimal cash management strategy can be determined through the use of a multiple linear programming model. The construction of the model comprises three sections.

1. selection of the appropriate planning horizon,
2. selection of the appropriate decision variables,
3. formulation of the cash management strategy itself.

The advantage of linear programming model is that it enables coordination of the optimal cash management strategy with the other operations of the firm such as production and with less restrictions on working capital balances.

Notes: 1. Model basically uses one year planning horizon with 12 monthly periods because of its simplicity.

2. It has four basiç sets of decisions variables which influence cash management of a firm and must be incorporated in linear programming model of firm. These are—(*a*) payment schedule, (*b*) short-term financing, (*c*) purchase and sale of marketable securities, (*d*) cash balance.

The formulation of the model requires that the financial managers first specify an objective function and then specify a set of constraints.

Orgler's objective function is to minimise the horizon value of the net revenues from the cash budget over the entire planning period.

Assumption.

1. All revenues generated are immediately reinvested.
2. Any cost is immediately financed.

Objective function represents the value of the net income from the cash budget at the horizon by adding the net returns over the planning period.

Thus, the objective function recognises each operations of the firm that generates cash inflows or cash out flows as adding or subtracting profit opportunities for the firm from its cash management operations.

In the objective function, decision variable which cause inflows, such as payments on receivables, have (+*ve*) positive coefficient while decision variables which generate cash out flows such as interest on short-term borrowings have (–*ve*) negative coefficient. While the sale of those securities would incur conversion cost and have a (–*ve*) negative coefficient.

Objective function

$$\text{Maximise profit} = a_1 x_1 + a_2 x_2$$

The constraints of the model could be—

(*i*) institutional

(*ii*) policy constraints

Institutional constraints are those imposed by external factors *i.e.*, bank required compensating balance.

Notes

Policy constraints are imposed on cash management by the firm itself e.g., financial manager may be prohibited from selling securities before maturity.

Either constraints can occur in the model during one monthly period or over several or all the months in the one year planning horizon.

Note: A very important feature of this model is that it allows the financial managers to integrate cash management with production and other aspects of the firm.

5.7. CASH BUDGET

Cash budget represents cash requirements of business during the budget period. It is the plan of receipts and payments and payments of cash during the budget period. Cash budget can be prepared for short period or for long period.

5.7.1 Cash Budgets for Short Period

Preparation of cash budget month by month would involve making the following estimates.

(*a*) As regards receipts–

1. Receipts from debtors
2. Cash sales
3. Any other sources of receipts of cash e.g., dividend etc.

(*b*) As regards payments

1. Payments to be made for purchases
2. Payments to be made for expenses
3. Payments that once made periodically but not every month
   - (*i*) debenture interest
   - (*ii*) Income tax paid in advance
   - (*iii*) Sales tax
4. Special payments to be made in a particular months e.g., dividends to shareholders, redemption of debenture, repayments of loans, payment for assets acquired etc.

5.7.2 Format of Cash Budget

M/s ....

Cash Budget

Period ....

Particulars	M_1	M_2	M_3	....	M_{12}
Receipts					
(*i*) Opening balance					
(*ii*) Collection from debtors					
(*iii*) Cash sales					
(*iv*) Loans from bank					

(v) Share capital
(vi) Misc. receipts
(vii) Other items

Total

Notes

Payments

(i) To creditors
(ii) Wages
(iii) Overheads
  (a)
  (b)
  (c)
(iv) Interest
(v) Dividend
(vi) Corporate tax
(vii) Capital Expenditure
(viii) Other items

Total

Closing balance

(+ve → surplus, –ve → shortfall)

Illustration: M/s Shiva Enterprises is a wholesaler and ends its fiscal year on December 31. As the company's accountant you are requested in early January of the current year to assist in the preparation of cash budget on the basis of following informations.

(i) Management believes that the pattern of the last year is a reasonable basis for estimating sales for the current year. Sales in the last year were as follows.

January	₹ 3,60,000,	February	₹ 4,20,000
March	₹ 6,00,000,	April	₹ 5,40,000
May	₹ 4,80,000,	June	₹ 4,00,000
July	₹ 3,50,000,	August	₹ 5,50,000
September	₹ 5,00,000,	October	₹ 4,00,000
November	₹ 6,00,000,	December	₹ 8,00,000

Total – ₹ 60,00,000

(ii) Accounts receivable on December 31 of the last year = ₹ 3,80,000, sales collection are generally made as follows:
  (a) During the month of sale 60%
  (b) In the subsequent month 30%
  (c) In the second subsequent month 9%
  (d) Uncollectable 1%

Notes

(iii) Purchase cost of goods average 60% of selling price. The cost of the inventory in hand on December 31, of the last year is ₹ 8,58,000 of which ₹ 30,000 is obsolete. Arrangement has been made to sell the obsolete inventory in January at half of the normal selling price in cash.

The company wishes to maintain the inventory on the first of each month at a level of 3 months sales as determined by the sales forecasts for the next three months including budget-month. All purchases are paid for on the 10th of the following month. Accounts payable for purchases on December 31 of the last year total ₹ 3,70,000.

(iv) Recurring fixed expenses amount to ₹ 1,20,000 per month including depreciation of ₹ 20,000, Variable expenses amount to 10% of sales, payments for expenses are made as follows.

	During the month	Following month
Fixed expenses	55%	45%
Variable expenses	70%	30%

(v) Annual rates and taxes amount to ₹ 10,000 and are paid in two equal installments on September 30 and March 31. The rates and taxes are in addition to the expenses in item (iv).

(vi) It is anticipated that cash dividends of ₹ 80,000 will be paid on the 15th day of last month of the year.

(vii) During winter, ususal advertising costs will be incurred which will require cash payment of ₹ 10,000 in February and ₹ 15,000 in March. The advertising costs are in addition to the expenses in item (iv).

(viii) Equipment replacements are made at the rate of ₹ 3,000 per month. The equipments has an average estimated life of 6 years.

(ix) The company's income tax for the last year is ₹ 2,30,000. Advance tax paid is ₹ 2,10,000. The balance of the tax due will be paid in May. Tax is payable in advance in 3 equal instalments on June 15, September 15 and December 15 on the basis of 50% of estimated profit.

(x) On December 31, of the last year the company had a bank loan with unpaid balance of ₹ 80,000. The loan requires a principal payment of ₹ 20,000 on the last day of each month (+) interest @ 0.5% per month on unpaid balance at the first of every month. The entire balances is due on March 31 of the current year.

(xi) The cash balance on December 31 of the last year is ₹ 1,10,000.

Prepare the cash budget statement for each of 1st six months of the current year for M/s Shiva Enterprises.

Solution:

M/s Shiva Enterprises

Cash budget statement for each of the 1st six months from Jan. to June.

Particulars	Jan.	Feb.	Mar.	Apr.	May	June
Receipts	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
Opening balance	1,00,000	92,400	26,900	39,500	1,82,500	3,03,700
Cash sales	25000	–	–	–	–	–
Collection from debtors*	5,10,000	4,32,000	5,18,400	5,41,800	5,04,000	4,32,600
Total 'A'	6,35,000	5,24,400	545,300	5,81,300	6,86,500	736,300
Payments						
Purchases-**	3,70,000	3,24,000	2,88,000	2,40,000	2,10,000	3,30,000
Fixed Expenses	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Variable Expenses.***	49,200	40,200	54,600	55,800	49,800	42,400
Rates and taxes	–	–	5,000	–	–	–
Unsual advertising	3,000	3,000	3,000	3,000	3,000	3,000
Income tax previous year	–	–	–	–	20,000	–
Income tax current year****	–	–	–	–	–	43,183
Interest*****	400	300	200	–	–	–
Bank prepayment	20,000	20,000	40,000	–	–	–
Total 'B'	5,42,600	4,87,500	4,90,800	3,98,800	3,82,800	5,18,583
Closing balance						
Surplus/Deficit (A – B)	92,400	36,500	54,500	1,83,300	3,03,700	2,17,717

Notes

Working notes:

* Collection from debtors in January

	₹
60% of sales in January current year	2,16,000
30% of sales in December previous year	2,40,000
9% of sales in November previous year	54,000
	5,10,000

**Payments for purchases							
Particulars	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**
Stock required on	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
1st of each month for sales in next 3 months	13,80,000	15,60,000	16,20,000	14,20,000	12,30,000	13,00,000	14,00,000
Cost of stock required (60% of sales next 3 month)	8,28,000	9,36,000	9,72,000	8,52,000	7,38,000	7,80,000	8,40,000
Closing stock at the end	9,36,000	9,72,000	8,52,000	7,38,000	7,80,000	8,40,000	
(+) cost of goods sold (60%of sales during month)	2,16,000	2,52,000	3,60,000	3,24,000	2,88,000	2,40,000	
Total	11,52,000	12,24,000	12,12,000	10,62,000	10,68,000	10,80,000	
(–) opening stock	8,28,000	9,36,000	9,72,000	8,52,000	7,38,000	7,80,000	
Purchase to be made	3,24,000	2,88,000	2,40,000	2,10,000	3,30,000	3,00,000	

***–Variable to be made

Notes

	January	February
30% of 10% of sales of previous month	24,000	10,800
30% of 10% of sales of previous month	25,200	29,400
	49,200	40,200

Note: The variable expenses of other 4 months be compounded in the same manner.

******–Income tax payable on estimated net profit during the year**

	₹	₹
Sales, (normal items)	–	60,00,000
(+) sale of abnormal items in Jan $\left(1/2 \times 30,000 \times \frac{100}{60}\right)$	–	25,000
		60,25,000
(–) cost of goods sold	36,00,000	
Normal 60% of 60,00,000		
Abnormal	30,000	36,30,000
		23,95,000
(–) Expenses fixed		
(1,20,000 × 12)	14,40,000	
Variable	6,00,000	
Unusual advertising	25,000	
Rates & taxes	10,000	
interest	900	
Bad debts	60,000	21,35,900
Estimated net profit		2,59,100
Income tax @ 50%		1,29,550
Income tax payable in June (1/3 of 1,29,550)		43,183

- It is assumed that the depreciation on equipment replacement as per item (*viii*) of the question is included in the depreciation of ₹ 20,000 mentioned in item (*iv*)

***** Interest on loan	₹
January 0.5% on 80,000	400
February 0.5% on 60,000	300
March 0.5% on 40,000	200
	900

5.7.3 Cash Budget for Long Period

Long range cash forecast often resemble the projected service and

application of funds statement. The following procedure may be adopted to prepare long range cash forecasts.

(*i*) Cash in hand and Cash in bank

(*ii*) (+) Add

(*a*) Trading profit (before tax) expected to be earned

(*b*) Depreciation and other development expenses incurred to be written off.

(*c*) Sale proceeds of assets

(*d*) Proceeds of fresh issue of share or debentures

(*e*) Reduction in working capital that is current assests (except cash) (–) lass amount liabilities.

(*iii*) (–) deduct–

(a) Dividends to be paid

(*b*) Cost of assets to be purchased

(*c*) Taxes to be paid

(*d*) Debentures or Shares to be redeemed

(*e*) Increase in working capital

Illustration. Profit and loss a/c for two years of M/s Shiva Enterprises is given below.

Profit/loss a/c

	Y_1	Y_2		Y_1	Y_2
To Opening stock	80,00,000	1,00,000	By sales	8,00,00,000	10,00,00,000
To Raw materials	3,00,00,000	4,00,00,000	By closing	1,00,00,000	1,50,00,00
To Stores	1,00,00,000	1,20,00,000	stock		
To Manuf. expenses	1,00,00,000	1,60,00,000	By misc. income	10,00,000	10,00,000
To Other expenses	1,00,00,000	1,00,00,000			
To Deprecation	1,00,00,000	1,00,00,000			
To Depreciation	1,00,00,000	1,00,00,000			
To Net profit	1,30,00,000	1,80,00,000			
	9,10,00,000	11,60,00,000		9,10,00,000	11,60,00,000

In Y_3 sales are expected to be ₹ 12,00,00,000

As a result other expenses will increase by ₹ 50,00,000 except other changes. Only raw materials are in stock. Assume sales and purchase are in cash terms only and the closing stock is expected to go up by the same amount as between Y_1 and Y_2. No dividend is being paid. The firm can use 75% of the cash generated to service a loan. How much cash from operations will be available in Y_3 for this purpose? When income tax is ignored.

Notes

Solution:

Projected P/L a/c for Y_3					
	Y_2 (Actual) (₹ in lakhs)	Y_3 (Projected) (₹ in lakhs)		Y_2 (Actual) (₹ in lakhs)	Y_3 (Projected) (₹ in lakhs)
To material consumed	340	420	By sales	1,000	1,200
To stores	120	144	By misc. incom	10	10
To manf. expenses	160	192			
To other expenses	100	150			
To depreciation	100	100			
To net profit	180	204			
	10,00	1,210		1,010	1,210

Cash flow

	(₹ in lakhs)
Profit	204
(+) Add depreciation	100
	304
(–) less cash required for increase in stock	50
Net cash flow	254

Cash availabl for servicing the loan: 75% of ₹ 2,54,000 = ₹ 1,90,50,000

Working notes:

(*i*) Material consumed in Y_2 – 35% of sales

likely consumption in Y_3 – $1200 \times \frac{35}{100}$ = ₹ 420 lakhs

(*ii*) Store are 12% of sales in Y_2 in Y_3 also stores will be 12% of sales.

(*iii*) Manufacturing expenses are 16% of sales.

5.8. MOTIVES FOR HOLDING CASH

The term cash with reference to cash management is used in two senses.

In a narrow sense, it is used broadly to cover currency and generally accepted equivalents of cash, such as cheques, demand drafts and deposits in banks.

The broad view of cash also includes near-cash assets such as marketable securities and time deposits in banks. The main characteristics of these is that

they can be readily sold and converted into cash and serve as a reserve pool of liquidity that provides cash quickly when needed. They also provide a short-term investment outlet for excess cash and are also useful for meeting planned outflow of funds.

Notes

Note: The term cash management is employed in the broader sense.

Irrespective of the firm in which it is held a distinguishing feature of cash as an asset, is that it has no earning power. Still cash is always held. The motives behind holding the cash are as follows:

(*i*) Transaction motive

(*ii*) Precautionary motive

(*iii*) Speculative motive

(*iv*) Compensating motive.

5.8.1 Transaction Motive

An important reason for maintaining cash balances is the transaction motive. This refers to the holding of cash to meet routine cash requirements to finance the transactions which a firm carries on in the ordinary course of business. A firm enters into a variety of transactions to accomplish its objectives which have to be paid for in the form of cash. *Example,* cash payment for purchases, wages, operating expenses, financial charges like interest, taxes, dividends and so on.

Similarly there is a regular inflow of cash to the firm from sales operations, returns on outside investments and so on. These receipts and payments constitute a continuous two way flow of cash. But the inflows and outflows do not perfectly coincide.

At time receipts exceeds outflows while at other times, payments exceeds inflows. To ensure that the firm can meet its obligations when payments become due in a situation in which payments exceeds inflows or receipts, it must have an adequate cash balance.

In other words "The requirement of cash balances to meet routine cash needs is known as the transaction motive and such motive refers to the holding of cash to meet anticipated obligations whose timing is not perfectly synchronized in the cash receipts."

Notes:

1. If receipts and payments of cash could exactly coincide in the normal course of operations, a firm would not need cash for Transaction purposes.
2. Although a major part of transaction balances are held in cash, a part may also be in such marketable securities whose maturity conforms to the terming of the anticipated payments, such as payment of taxes, dividends etc.

Notes

5.8.2 Precautionary Motive

In addition to the non-synchronization of anticipated cash inflows and outflows, in the ordinary course of business, a firm may have to pay cash for purposes which cannot be predicated or anticipated. The unexpected cash needs at short notice may be the result of—

(*i*) Floods, strikes and failure of important customers.

(*ii*) Bills may be presented for settlement earlier than expected.

(*iii*) Unexpected slow down in collection of accounts receivable.

(*iv*) Cancellation of some orders for goods as the customer is not satisfied.

(*v*) Sharp increase in cost of raw materials.

"The cash balances held in reserve for such random and unforeseen fluctuations in cash flows are called as precautionary balances."

In other words, precautionary motive of holding cash implies the need to hold cash to meet unpredictable obligations.

Notes:

1. Precautionary cash balance serves to provide a cushion to meet unexpected contingencies.
2. The more unpredictable are the cash flows the larger is the need for such balances.
3. If availability of short-term credit is more, the need to maintain a precautionary cash balance will be less and vice-versa.
4. These cash balances are usually held in the form of marketable securities so that these earn a return.

5.8.3 Speculative Motive

It refers "to the desire of a firm to take advantage of opportunity/ies which presents themselves at unexpected movements and which are typically outside and normal course of business."

Notes:

1. Precautionary motive is defensive in nature in that firms must make provision to tide over unexpected contingencies.
2. Speculative motive represents a positive and aggressive approach. Firms aim to exploit profitable opportunities and keep cash in reserve to do so.

The speculative motive helps to take advantage of —

(*a*) An opportunity to purchase raw materials at a reduced price on payment of immediate cash.

(*b*) A chance to speculate on interest rate movements by buying securities when interest rates are expected to decline.

(c) Delay purchases of raw materials on the anticipation of decline in price.

(d) Make purchases at favourable prices.

5.8.4 Compensating Motive

Notes

Another motive to hold cash balances is to compensate banks for providing certain services and loan.

Banks provide a variety of services to business firms as clearance of cheque, supply of credit information, transfer of funds etc., while for some of these services banks charge a commission or fee, for others they seek indirect compensations.

Usually clients are required to maintain a minimum balance of cash at the bank. Since this balance cannot be utilized by the firms for transaction purposes, the banks can use the amount to earn a return. Such balances are compensating balances.

Compensating balances are also required by some loan agreements between a bank and its customers. During periods when supply of credit is restricted and interest rates are rising, bank require a borrower to maintain a minimum balance in his account as a condition precedent to the grant of loan. This is presumably to compensate the bank for a rise in the interest rate during that period, when loan will be pending.

The compensating cash balances can take either of following two forms.

(i) an absolute minimum, amount below which the actual bank balance will never fall.

(ii) a minimum average balance over the month.

Notes:

1. The first form or alternative is more restrictive as the average amount of cash held during the month must be above that minimum balance by the amount of the transaction balance.
2. From the point of view of firm, this is obviously dead money.
3. The second form is quite suitable for the firm's and can agree with the bank.

Out of four primary motives of holding cash only transaction motive and compensation motive are important. Firms usually do not speculate and need not have speculative balances. The requirement of precautionary balances can be meet out of short-term borrowings.

5.9. CASH MANAGEMENT : BASIC STRATEGIES

Cash budget gives the net cash position of a firms. After knowing the cash position the management should work out on the basic strategies to be employed to manage its cash.

The broad cash management strategies are essentially related to the cash turnover process, that is the cash cycle together with cash turnover.

Notes

Cash cycle is the process by which cash is used to purchase materials from which goods are produced and when these are sold to customers who latter pay the bills. The firm receives cash from customers and cycle repeats itself.

Cash turnover means the number of times cash is used during each year.

Cash cycles has usually following steps—

(*a*) Materials ordered

(*b*) Materials received

(*c*) Payments

(*d*) Cheque clearance

(*e*) Goods produced

(*f*) Goods sold

(*g*) Customer makes payments

(*h*) Payment received

(*i*) Cheques deposited

(*j*) Funds collected

In cash management strategy, the time period involved at each step is concerned/ important.

Notes:
1. Firm has no control over the time involved between step '*a*' and '*b*'.
2. The time lag between '*d*', '*e*' and '*f*' is determined by the production process and inventory policy.
3. The time period between steps '*f*' and '*g*' is determined by credit norms and payment policy of customers.

Example:

A firm which purchases raw materials on credit is required by the credit terms to make payments within 30 days. On its side, the firm allows its credit buyers to pay within 60 days. Its experiences has been that it takes on an average 35 days to pay its accounts payable and 70 days to collect its accounts receivable. Moreover 85 days elapse between the purchase of raw materials and sale of finished goods, that is to say, the average age of inventory is 85 days. Calculate the firm's cash cycle and estimate cash turnover?

Solution: The cash cycle of the firm can be calculated by finding the average number of days that elapse between the cash outflows associated with paying accounts payable and the cash inflows associated with collecting accounts receivable.

Cash cycle = 85 days + 70 days – 35 days = 120 days

$$\text{Cash turnover} = \frac{\text{No of days in a year (working)}}{\text{Cash cycle}}$$

$$= 360/120 = 03 \quad \textbf{Ans.}$$

5.10. MINIMUM OPERATING CASH

Notes

The higher is the cash turnover the lesser is requirement of cash in a firm. Therefore firm should try to minimise the cash turnover. But must maintain a minimum amount of operating cash balance so that it does not run out of cash.

The minimum amount or minimum level of operating cash is determined by the—

Total operating annual outlays/rate of cash turnover.

For example: if the total operating annual outlay of a firm is ₹ 240 lakhs, and rate of cash turnover is 3.

Then 240/3 = 80 lakh, will be the minimum cash requirement.

The operational implication of the minimum operating cash requirement is that if the firm has opening cash balance of ₹ 80 lakhs, it would be able to meet its obligations when they became due.

In other words, it would not have to borrow anything. But the minimum operating cash involves a cost in terms of the earnings foregone from investing it temporarily, that is to say, there is an opportunity cost.

If 10% return on a riskless investment, the cost of minimum cash balance of ₹ 80 lakhs will be ₹ 8 lakhs.

Cash management strategies to the minimum cash balance requirement. The basic strategies that can be employed to do the needful are as follows:

(*i*) Stretching accounts payable

(*ii*) Efficient inventory-Production management

(*iii*) Speedy collection of accounts receivable

(*iv*) Combined cash management strategies

5.10.1 Stretching Accounts Payable

One basic strategy of efficient cash management is to stretch the accounts payable. In other words, a firm should pay its accounts payable as late as possible without damaging its credit standing.

Note: It should, however, take advantage of the cash discount available on prompt payment. In the above example, if the accounts payable from the current level of 35 days to 45 days, the cash cycle will 85 + 70 – 45 = 110 days, the cash turnover will be 360/110 = 3.27. This will lead to a decrease in the minimum cash requirement from ₹ 80 lakhs to ₹ 73.40 lakhs.

5.10.2 Efficient Inventory-Production Management

Another strategy is to increase the inventory turnover avoiding stock-outs that is shortage of stock. This can be clone in the following ways—

1. Increasing the raw materials turnover by using more efficient inventory control techniques.

Notes

2. Decreasing the production cycle through better production planning scheduling and control techniques. It will lead to an increase in the W/P inventory turnover.
3. Increasing the finished goods turnover through better forecasting of demand and a better planning of production.

In the above example, if able to reduce the average age of its inventory from 85 to 70 that is by 15 days then the cash cycle will be = 70 + 70 – 35 = 140 – 35 = 105 days.

Cash turnover will be 360/105 = 3.43

The effect of an increase in the cash turnover will be to reduce the minimum cash requirement from ₹ 80 lakhs to ₹ 70 lakhs.

Thus, efficient inventory and production management causes a decline in the operating cash requirement hence, a saving in cash operating costs.

5.10.3 Speeding Collection of Accounts Receivables

Another strategy for efficient cash management to collect accounts receivable as quickly as possible without losing sales because of high pressure collection techniques.

The average collection period of receivables can be reduced by changes in—

(*i*) Credit terms

(*ii*) Credit standards

(*iii*) Collection policies

Credit standards represents the criteria for determining to whom credit should be extended. The collection policies determine the efforts put forth to collect accounts receivable promptly.

In the above example, if firm manages to reduce the average age of its accounts receivable from the current level of 70 days to 50 days then cash cycle will be = 85 + 50 – 35 = 100 days.

and Cash turnover = 360/100 = 3.6

The operating cash requirement will fall from 80 lakhs to approximately ₹ 66.67 lakhs. Thus a reduction in the average collection period by 20 days, releases funds equivalent to ₹ 13.33 lakhs and leads a saving in cash operating cost of ₹ 1.33 lakhs.

5.10.4 Combined Cash Management Strategies

The effect of individual strategies on the efficiency of cash management is favourable on operating cash requirement.

In the above example if—

(*i*) increases the average accounts payable by 10 days = 35 + 10 = 45 days.

(*ii*) reduces the average age of inventory by 15 days = (85 – 15) = 70 days.

(*iii*) Speeds up the collection of accounts receivable by 20 days = 70 – 20 = 50 days. Then cash cycle = 70 + 50 – 45 = 120 – 45 = 75 days.

Cash turn over = 360/75 = 4.8

Minimum operating cash requirement = 240/4.8 = ₹ 50 lakhs.

assuming a 10% rate of interest, the saving in cash operating cost will be ₹ 3 lakhs. The three basic strategies of cash management related to

(*a*) Accounts payable

(*b*) Inventory

(*c*) Accounts receivable

lead to a reduction in the cash balance. But they imply certain problems for the management. These are:

1. If the accounts payable are postponed too long the credit standing of the firm may be adversely affected.
2. A low level of inventory may lead to a stoppage of production as sufficient raw materials may not be available for uninterrupted production of the firm may be short of enough stock to meet the demand for its product that is stock out.
3. Restrictive credit standards, credit terms and collection policies may jeopardise sales.

Note: These implications should be constantly kept in view while working out cash management strategies.

5.11. CASH MANAGEMENT TECHNIQUES/PROCESSES

The strategic aspects of efficient cash management are—efficient inventory management, speedy collection of accounts receivable and delaying payments on accounts payable. There are some specific techniques and processes for speedy collection of receivables from customers and slowing disbursements.

5.11.1 Speedy Cash Collections

In managing cash efficiently, the cash inflow process can be accelerated through systematic planning and refined techniques. There are two broad approaches to do this.

(*i*) The customers should be encouraged to pay as quickly as possible.

(*ii*) The payment from customer should be converted into cash without any delay.

5.11.2 Prompt Payment by Customers

One way to ensure prompt payment by customers is prompt billing. What the customer has to pay and the period of payment should be notified accurately and in advance. The use of mechanical devices for billing along

Notes

Notes

with the enclosure of a self-addressed return envelop will speed up payment by customers.

Another and more important, technique to encourage prompt payment by customers, is the practice of offering cash discounts. The variability of discount implies considerable saving to the customers. To avail the facility the customers would be eager to make payment early.

5.11.3 Early Conversion of Payments into Cash

Once the customer makes the payment by writing a cheque in favour of the firm, the collection can be expedited by prompt encashment of the cheque.

There is a lag between the time a cheque is prepared and mailed by the customer and the time the funds are included in the cash reservoir of the firm. With in this time interval three steps are involved.

5.11.3.1 Transit or mailing time

It is the time taken by the post offices to transfer the cheque from the customer to the firm. This delay or lag is referred to as postal float.

5.11.3.2 Time taken in processing the cheque within the firm

Before they are deposited in the banks, known as lethargy.

5.11.3.3 Collection time within the bank

It is the time taken by the bank in collecting the payment from the customer's bank called bank float.

The early conversion of payment into cash as a technique to speed up collection of accounts receivable, is done to reduce the time lag between posting of the cheque by the customer and the realisation of money by the firm.

Note: Postal float, lethargy and bank float are collectively referred to as deposit float and can be defined as the sum of cheques written by customers that are not yet usable by the firm.

The collection of accounts receivable can be considerably accelerated by reducing transit, processing and collection time.

An important cash management technique is reduction in deposit float. This is possible if a firm adopts a policy of decentralized collections.

Following are some of the important processes that ensure decentralized collection as to reduce.

(*i*) the amount of time that elapses between the mailing of a payment by a customer,

(*ii*) the funds become available to the firm for use.

The principal methods of establishing a decentralised collection network are:

(*a*) Concentration Banking

(*b*) Lock box system

Notes

1. **Concentration Banking.** In this system of decentralized collection of accounts receivable, large firms which have a large number of branches at different places, select some of the strategically located branches as collection centres for receiving payment from customers.

   Instead of all the payments being collected at the head office of the firm, the cheques for a certain geographically areas as are collected at the specified local collection centre.

   Under this programme/arrangement, the customers are required to send their payments *i.e.*, cheques to the collection centre covering the area in which they live and these are deposited in the local account of the concerned collection centre, after meeting local expenses, if any.

Notes:

1. Funds beyond a predetermined minimum one transferred daily to a central or disbursing or concentration bank or account.
2. A concentration bank is one which the firm has a major account usually a disbursement account.
3. This arrangement is called as concentrating banking.

   Concentrating banking as a system of decentralised billing and multiple collection points, is a useful technique to expedite the collection of accounts receivable. It reduces the time needed in the collection process by reducing the mailing time. Since the collection centres are near the customers the time involved in sending the bill to the customer is reduced. Moreover, the time lag between the despatch of the cheque by sending the bill to the customer is reduced. Mailing time is saved both in respect of sending the bill to the customers as well as in receipt of payment.

   The second reason of reduced deposit float by concentration banking is that banks of the firm as well as customers may be in close proximity.

   Thus, the arrangement of multiple collection entries with concentration banking results in a saving of time in both mailing and clearance of customer payments and lead to a reduction in the operating cash requirements.

   Another advantage is that concentration permits the firm to store its cash more efficiently. This is so mainly because by pooling funds for disbursement in a single account, the aggregate requirement for cash balance is lower than it would be if balances are maintained at each branch office.

2. **Lock-Box System.** The banking arrangement is instrumental in reducing the time involved in mailing and collection. But with this system of collection of accounts receivable, processing for purpose

Notes

of interal accounting is involved, that is same time elapses before a cheque is deposited by the local collection centre in its account.

The lock-box system takes care of this kind of problem, apart from effecting economy in mailing and clearance times.

Under this arrangement firms hire a post office lock-box at important collection centres. The customers are required to remit payments to the post office lock-box. The local banks of the firm, at the respective places are authorised to open the box and pick up the remittances *i.e.*, cheques received from the customers. Usually, the authorised banks, pick up the cheques several times a day and deposit them in the firm's accounts. After crediting the accounts of the firm, the bank send a deposit slip along with the list of payments and other enclosures, if any, to the firm by way of proof and record of the collection.

Thus, the lock box system is like concentration banking in that the collection is decentralised and is done at the branch level. But they differ in one very important aspect. While the customer sends the cheques, under the concentration banking arrangement, to the collection centre, he sends them to a post office box, under the lock box system. The cheques are directly received by the bank which empties the box and not from the firm or its local branch.

The lock box arrangement is an improvement over the concentration banking system. Its superiority arises from the fact that one step in the collection process is eliminated with the use of lock box, the receipt and deposits of cheques by the firm.

In other words, the processing time within the firm before depositing a cheque in a bank is eliminated. Also, some extra saving in mailing timing is provided by the lock box system, as the cheques received in post office box are not delivered either by the post office or the firm itself to the bank rather bank itself picks them up at the post office.

Thus, the lock box system, as a method of collection of receivables has a time fold advantages.

1. the bank performs the clerical task of handing the remittances prior to deposits, services which the bank may be able to perform at lower cost.
2. the process of collection through the banking system begins immediately upon the receipt of cheque/remittance and does not have to wait until the firms completes its processing for internal accounting purposes. The steps involved in cash cycle are merged therefore, the time lag between payment by a customer and the availability of funds to the firm for use would be reduced and the collection of receivables would be accelerated.

Notes

Although the use of concentration banking and lock box systems accelerate the collection of receivables, they involve a cost. While in the case of the former, the cost is in terms of the maintence of multiple collection centres, compensation to the bank for services represents in the cost associated with the latter.

The justification for the use or otherwise of these special cash management techniques would be based on a comparison of the cost with the return generated on released funds.

If the income exceeds the cost, the system is profitable and should be used otherwise not.

Note: These techniques can be more useful only for large firms which receive a large number of cheques from a wide geographical area.

Example: A firm uses a continuous billing system that results in an average receipt of ₹ 40,00,000. It is contemplating the institution of concentration banking instead of current system of centralised billing and collection. It is estimated that such a system would reduce the collection period of accounts receivable by 2 days.

Concentration banking would cost ₹ 75,000 annually and 8% can be earned by the firm on its investments. It is also found that a lock-box system could reduce its overall collection time by 4 days and could cost annually ₹ 1,20,000.

(*i*) How much cash would be released with concentration banking system?

(*ii*) How much money can be saved due to reduction in the collection period by 2 days? Should the firm institute the concentration banking system?

(*iii*) How much cash would be freed by lock-box system?

(*iv*) Which system be better between concentration banking and lock-box system.

Solution:

(*i*) Cash released by concentration banking system = ₹ 40,00,000 × 2 days = ₹ 80,00,000

(*ii*) Savings = 0.08 × 80,00,000 = ₹ 6,40,000 as the cost of concentration banking is ₹ 75,000 and savings are ₹ 6,40,000 hence concentration banking can be instituted.

(*iii*) Cash released by lock-box system

= ₹ 40,00,000 × 4 days

= ₹ 1,60,00,000

Savings in lock-box system = 0.08 × 1,60,00,000

= ₹ 12,80,000

Notes

(*iv*) The comparing of savings from concentration banking and lock-box system reveals that lock-box system is better than centralised banking because—

(*a*) In the case of lock-box system saving =	₹ 12,80,000
(*b*) In the case of centralised banking system saving =	₹ 1,20,000
Net saving (*a* – *b*) =	₹ 11,60,000

is much higher hence to be adopted.

3. **Slowing Disbursements**. Apart from speedy collection of accounts receivables the operating cash requirement can be reduced by slow disbursements of accounts payable.

In fact, slow disbursements represents a service of funds requiring no interest payments. There are several techniques to delay payment of, accounts payable, namely.

(*a*) avoidance of early payments

(*b*) centralised disbursements

(*c*) floats

(*d*) accruals

(*a*) Avoidance of early payments. One way to delay payments is to avoid early payments. According to the terms of credit, a firm is required a make a payment within a stipulated period. It entitles a firm to cash discount. If however, payments are delayed beyond the due date, the credit standing may be adversely affected so that the firms would find it difficult to secure trade credit latter.

But if the firm pays its accounts payable before the due date it has no special advantage. Thus, a firm would be well advised not to make payments early that is before the due date.

(*b*) Centralised disbursements. Another method to slow down disbursements is to have centralised disbursements. All the payments should be made by the head office from a centralised disbursement account. Such an arrangement would enable a firm to delay payments and conserve cash for several reasons.

(*i*) It involves increase in the transit-time. The remittance from the head office to the customers in distant places would involve more mailing time than a decentralised payment by the local branch.

(*ii*) The reason for reduction in operating cash requirement is that since the firm has a centralised bank account, a relatively smaller total cash balance will be needed.

In the case of a decentralised arrangement, a minimum cash balance will have to be maintained at each branch which will add to large operating cash balance.

Schedules can be lightly controlled and disbursements made exactly on the right day.

(c) **Float.** A very important technique of slow disbursements is float. The term float refers to the amount of money tied up in cheques that have been written but have yet to be collected and encashed.

Alternatively, float represents the difference between the bank balance and book balance of cash of a firm.

The difference between the balance as shown by the firm's second and the actual bank balance is due to transit and processing delays.

There is a time lag between the issue of a cheque by the firm and its presentation to its bank by the customers bank for payment. The implication is that although the cheque has been issued, cash would be required later when the cheque is presented for encashment. Therefore, a firm can send remittances although it does not have cash in its bank at the time of issuance of cheque. Meanwhile, funds can be arranged to make payment when the cheque is presented for collection after a few days.

Note: Float used in this sense is called cheque kiting.

There are two ways to do float, *i.e.*,

(*a*) Paying from a distant bank.

(*b*) Scientific cheque encashing analysis.

Paying from a distant bank. The firm may issue a cheque on bank away from the creditors bank. This would involve relatively longer transit time for the creditors banks to get payment and thus, enable the firm to use its funds longer.

Scientific cheque encashing analysis. Another way to make use of float is to analyse on the basis of past experience, the time lag in the issue of cheques and their encashment.

Example: Cheques issued to pay wages and salary may not be encashed immediately, it may be spread over a few days.

25% on 1st day, 50% on 2nd day and balance on 3rd day. It would mean that the firm should keep in the bank not the entire amount of a payroll but only a fraction represented by the actual withdrawal each day. This strategy would enable the firm to save operating cash.

(*d*) **Accruals.** A potential tool for stretching accounts payable is accruals which are defined as current liabilities that represent a service or goods received by a firm but not yet paid for.

For example, payroll, that is remuneration to employees who render service in advance and received payment later. In a way, they extended credit to the firm for a period at the end of which they are paid, say a week or a month.

The longer the period after which payment is made, the greater is the amount of free financing consequently and the smaller is the amount of cash balances required. Thus, less frequent payrolls that is weekly as compared to monthly are an important service of accrual. They can be manipulated to slow down disbursements. Other examples of accrual are rent to lessons and

taxes to government. But these can be utilized only to a limited extent as there are legal constraints beyond which such payments cannot be extended.

5.12. MARKETABLE SECURITIES

Notes

Once the optimum level of cash balance of a firm has been determined, the residual of its liquid assets is invested in marketable securities.

Such securities are short-term investment instruments to obtain a return on temporarily idle funds. In other words, they are securities which can be converted into cash in a short period of time, typically in few days. The basic characteristics of marketable securities affect the degree of their marketability/ liquidity.

To be a liquid, a security must have two basic characteristics.

(*i*) a ready market

(*ii*) safety of principal

Ready marketability minimises the amount of time required to convert a security into cash. A ready market should have both breath in the sense of a large number of participants scattered over a wide geographical area as well as depth as determined by its ability to absorb the purchase/sale of large amount of securities.

The second determinant of liquidity is that there should be little or no loss in the value of a marketable security over time. Only those security/ies that can be easily converted into cash without any reduction in the principal amount qualify for short term investments. A firm would be better off leaving the balances in cash if the alternative were to risk a significant reduction in principal.

5.13. SELECTION CRITERION FOR MARKETABLE SECURITIES

A major decision confronting the financial managers involves the determination of the mix of cash and marketable securities.

Some of the quantitative models for determining the optimum amounts of marketable securities to hold in certain circumstances have been outlined. In general the choice of the mix is based on a trade-off between the opportunity to earn a return on idle funds *i.e.*, cash during the holding period, and the brokerage costs associated with the purchases and sale of marketable securities.

Example: Suppose a firm is paying ₹ 350 as brokerage costs to purchase and sell ₹ 45,000 worth of marketable securities, yielding an annual return of 8% and held for one month. The interest earned on securities = $\frac{1}{12} \times 0.08 \times 45{,}000 = ₹ 300$

Since this amount is less than the cost of the brokerages or transaction, hence not advisable for the firm to make investments.

This trade off between interest rate and brokerage is a key factor in determining the proportion of liquid assets should be held in the form of marketable securities.

There are three motives for maintaining liquidity (cash as well as marketable securities) and therefore, for holding marketable securities, transaction motive, safety/precautionary motive and speculative motive. Each motive is based on the premise that a firm should attempt to earn a return on temporarily idle funds. This type of marketable securities purchased will depend on the motive for the purchase.

An assessment of certain criteria can provide the financial manager with a useful framework for selecting a proper marketable securities mix. These considerations include evaluation of—

(*i*) Financial risk or default risk.

(*ii*) Interest rate risk

(*iii*) Taxability

(*iv*) Liquidity

(*v*) Yield among different financial assets.

5.13.1 Financial/default Risk

It refers to the uncertainty of expected returns from a security attributable to possible changes in the financial capacity of the security-issuer to make future payments to the security-owner.

If the chance of default on the terms of the investment is high, then the financial risk is said to be high.

If the chance of default on the term of investment is low, then the financial risk is said to be low.

$$\text{Chance of default} \propto \frac{1}{\text{risk}}$$

As the marketable securities portfolio is designed to provide a return on funds that would be otherwise tied up in idle cash held for transaction or precautionary purposes, the financial manager will not usually be willing to assume such financial/default risk in the hope of greater return within the make up of portfolio.

5.13.2 Interest Rate Risk

The uncertainty that is associated with the expected return from a financial instrument attributable to changes in interest rate is known as interest rate risk of particular concern to the corporate financial manager is the price volatility associated with instruments that have long, as opposed to short-term of maturity.

If prevailing interest rates rise compared with the data of purchase, the market price of the securities will fall to bring their yield to maturity in line with what financial manager could obtain by buying a new issue of a given instrument, for instance treasury bills.

Notes

The longer the maturity of the instrument the larger will be fall in prices.

To hedge against the price volatility caused by interest rate risk, the market securities portfolio will tend to be composed of instruments that mature over short periods.

5.13.3 Taxability

Another factor affecting observed difference in market yields is the differential impact of taxes. Securities, income on which tax-exempt, sell in the market at lower yields to maturity than other securities of the same maturity.

A differential impact on yields arises also because interest income is taxed at the ordinary tax rate while capital gains are taxed at a lower rate.

As a result, fixed interest securities that sell at a discount because of low coupon rate in relation to the prevailing yields are attractive to taxable investors. The reason is that part of the yield to maturity is a capital gain.

Owing to the desirability of discount on low interest fixed income securities, there yield to maturity tends to be lower than the yield on comparable securities with higher coupon rates.

The greater is the discount, the greater is the capital gains attraction and the lower is its yield relatively to what it would be if the coupon rate were such that the security was sold at par.

5.13.4 Liquidity

With reference to marketable securities portfolio liquidity refers to the ability to transform a security into cash.

Should an unforeseen event require that a significant amount of cash be immediately available a sizeable position of the portfolio might have to be sold. The financial manager will want the cash quickly and will not want to accept a large price reduction in order to convert the securities. Thus, in the formulation of preferences for the inclusion of particular instruments in the portfolio, consideration will be given to—

(*i*) Time period needed to sell the security

(*ii*) The likelihood that the security can be sold at or near its prevailing market price.

The latter element here, means that thin markets where relatively few transactions take place or where trader are accomplished only with large price changes between transactions, should be avoided.

5.13.5 Yield

The final selection criterion is the yields that are available on the different financial assets suitable for inclusion in the marketable/near-cash portfolio.

All the four factors listed above *i.e.*, financial/default risk, interest rate risk, taxability and liquidity influence the available yields on financial instruments. Therefore, the yield criterion involves a weighing of the risks

and benefits inherent in these factors. If a given risk is assumed, such as lack of liquidity then a higher yield may be expected on the instrument lacking the liquidity characteristics.

The finance manager must focus on the risk-return trade offs associated with the four factors on yield through his analysis. Coming to grips with these trade-off will enable the finance manager to determine the proper marketable securities mix for his firm.

Notes

5.14. ALTERNATIVES MARKETABLE SECURITIES

Following are the prominent marketable/near-cash securities.

1. Treasury bills
2. Negotiable certificates of deposits (CDs)
3. Commercial papers
4. Banker's acceptances
5. Repurchase agreements
6. Units
7. Intercorporate deposits
8. Bills discounting
9. Call market

5.14.1 Treasury Bills

These are obligations of the government and are sold on discount basis. The investor does not receive an actual interest payment. The return is the difference between the purchase price and the fare price i.e., par value of the bill.

The treasury bill are issued only in bearer form means these are purchased without the investors name upon them. This attribute makes these easily transferable from one investor to another. A very active secondary market exist for these bills. The secondary market for bills not only makes them highly liquid but also allows purchase of bills with very short maturity/ies.

As the bills have the full financial backing of the government, these are, for all practical purposes, risk free.

The negligible financial risk and the high degree of liquidity makes their yield lower than those on any marketable securities.

Due to their virtually risk free nature and active secondary market, treasury bills are one of the most popular marketable securities even though yield is less.

5.14.2 Negotiable Certificates of Deposits

These are marketable receipts for funds that have been deposited in a bank for a fixed period of time. The deposited funds earn a fixed rate of

Notes

interest. The denominations and maturities are tailored to the investor's needs.

The CDs are offered by banks on a basis different from treasury bills, that is, these are not sold at a discount. Rather, when the certificate matures, the owner receives the full amount deposited plus the earned interest.

A secondary market exists for the CDs while CDs may be issued in either registered or bearer form, the latter facilitates transactions in the secondary market and thus, is the most common.

The default risk in bank failure, the possibility of which is very low.

5.14.3 Commercial Papers

It refers to short term unsecured promissory note sold by large business firms to raise cash. As these are unsecured, the issuing side of the market is dominated by large companies which typically maintain sound credit ratings. Commercial papers (CPs) can be sold either directly or through dealers.

Notes:

1. Companies with high credit rating can sell directly to investors. The denominations in which these can be bought vary over a wide range.
2. These can be purchased similarly with varying maturity/maturities
3. These papers are generally sold on discount basis in bearer form although at times commercial papers can be issued carrying interest and made payable to the order of the investor.
4. There is no active trading in secondary market for commercial paper although direct sellers of CPs often repurchase it on request.
5. Financial manager when evaluates these for possible inclusion in marketable securities portfolio, he should plan to hold it to maturity.
6. Owing to its lack of marketability, CPs provide a yield advantage over other near-cash assets of comparable maturity.

5.14.4 Banker's Acceptances

These are drafts (order to pay) drawn on a specific bank by an exporter in order to obtain payment for goods he has shipped to a customer who maintains an account with that specific bank.

This can also be used in financing domestic trade. The draft guarantees payment by the accepting bank at a specific point of time. The seller who holds such acceptance may sell it at a discount to get immediate funds. Thus, the acceptance becomes a marketable security.

Since the acceptance are used to finance the acquision of goods by one party the document is not issued in specialised denominations its size/ denomination is determined by the cost of goods being purchased.

These serve a wide range of maturities and sold on a discount basis, payable to the bearer. A secondary market for the acceptances of large banks does exist.

Owing to their greater financial risk and lesser liquidity, acceptances provide investors a yield advantage over treasury bills of like maturity. In fact, the acceptances of major banks are a very safe investment, making the yield advantage over treasury bills worth looking for marketable securities portfolio.

Notes

5.14.5 Repurchase Agreements

These are legal contracts that involve the actual sale of securities by a borrower to the lender with a commitment on the part of the former to repurchase the securities at the current price plus a stated interest change. The securities involved are government securities and other money market instruments. The borrower is either a financial institution or a security dealer.

There are two major reasons when a firm with excess cash prefer to buy repurchase agreements rather than a marketable security. These are as below—

1. The original maturities of the instrument being sold can, in effect, be adjusted to suit the particular needs of the investing firm, therefore, funds available for a very short period, that is one/two days can be employed to earn a return.
2. Since the contract price of the securities that make up the arrangement is fixed for the duration of the transaction, the firm buying the repurchase agreement is protected against market fluctuation throughout the contract period. This makes it a sound alternative investment for funds that are surplus for only short periods.

5.14.6 Units

The units of Unit Trust of India (UTI) offer a reasonably convenient alternative avenue for investing surplus liquidity as —

(*i*) there is very active secondary market for these;

(*ii*) the income from units is tax exempt upto a specified amount;

(*iii*) the units appreciate in a fairly predictable manner.

5.14.7 Intercorporate Deposits

It is a short-term deposits with other companies is a fairly attractive form of investment of short-term funds in terms of rate of return which currently ranges between 12 to 15%. However, apart from the fact that one month's time is required to convert these into cash, intercorporate deposits suffer from higher degree of risk.

5.14.8 Bill Discounting

Surplus funds may be deployed to purchase/discount bills. Bills of exchange are drawn by seller (drawer) on the buyer (drawee) for the value of goods delivered to him. During the pendency of the bill, if the seller is in need of funds, he may get it discounted.

Notes

On maturity, the bill should be presented to the drawee for payment. A bill of exchange is a self-liquidating instrument.

Bill discounting is superior to intercorporate deposits for investing surplus funds.

While pending surplus funds in bills discounting, it should be ensured that the bills are trade bills arising out of genuine commercial transaction and as far as possible, these should be backed by letter of credit/acceptance by banks to ensure absolute safety of funds.

5.14.9 Call Market

It deals with funds borrowed/lent overnight/one day (call) money and notice money for period up to 14 days. It enables corporates to utilise their float money gainfully. However the returns (call rates) are highly volatile.

The stipulations pertaining to the maintenance of cash reserve ratio (CRR) by banks is the major determinant of the demand of funds and is responsible for volatility in the call rates.

Large borrowings by them to fulfil their CRR requirements pushes up the rates and a sharp decline takes place once these funds are met.

5.15. CASH MANAGEMENT PRACTICES IN INDIA

India is rapidly abandoning its paper-based clearing mechanism, with the Reserve Bank of India introducing initiatives covering cheque-imaging, real time gross settlement and electronic fund transfer. This trend is expected to increase further with the introduction of the Information Technology Act, a clearing corporation, a centralised fund management service, and use of the Structured Financial Messaging Solution for intra and inter bank messages.

India stride further into the new millennium riding on a wave of optimism. A decade of reforms has propelled the economy onto a new growth trajectory today. India is a mature and stable economy. There is now healthy competition among different Indian States to attract foreign investments, and India has joined the league of the fastest growing economies in the world, being next only to China and Korea.

The resurgence of the Indian economy has been sustained in the face of difficult international developments. Even as global growth has declined, India's GDP growth has accelerated in 2002 and reached to 6% in the 2003 fiscal year. Despite the worst drought in two decades in 2002, inflation rates have declined further and interest rates have softened. The momentum of the record inflow of FDI has continued and foreign exchange reserves were at all time high.

Indian economy is a market-driven economy. Due to the efforts taken by the Securities and Exchange Board of India (SEBI), the equity markets are mature, regulated and offer a wide range of equity and debt-linked products. India has a well established legal system with an independent judiciary. Indian corporates have had increased access to global capital markets. This

has driven conformity with international accounting standards, greater transparency and a focus on corporate governance. The government has accelerated the disinvestment process, demonstrating its commitment to the economy.

The banking structure in India is complex and spread over a wide geographical area. There are about 65,000 bank branches, and the central bank is the RBI.

The composition of banks in India is —

Scheduled commercial banks – 296,

Foreign banks – 42

Public sector banks – 27

Private sector banks – 31

Regional rural banks – 196

Schedule cooperative banks – 67

The Central Board of Direct Tax (CBDT) is the governing body for the direct taxes in India. Similarly, the Central Board for Customs and Excise (CBCE) is the main governing body for indirect taxes.

India had traditionally a paper based clearing system. As of 2002, India has about 1,047 clearing houses and 65,000 bank branches. The total value of the cheques processed through these centres surpassed INR 1,21,000 bn in the year 2001-02. The paper based clearing system passes such inherent issues as a high cost of processing fragility of the system and security risks. For these reasons, the RBI has been emphasing the need for upgrading the technological infrastructure in India. Following are some of the initiatives:

5.15.1 Cheque-Imaging

In some countries, cheques deposited in banks are scanned and stored with the bank. Instead of sending physical cheques to the clearing house, the scanned copy of the cheques are transmitted. This level of cheque-imaging reduces clearing cycle, enables faster returns-processing better customer service and availability of images for audit trails.

In India, 15 clearing houses, now have cheque-imaging. However, the images are now stored only for reconciliation and resolving clearing house differences. The legal framework is undergoing changes to adopt cheque imaging.

The Negotiable Instruments Act was amended in 2002, and has extended the definition of a cheque to include electronic cheques and the electronic images of truncated cheques. The act now also defines the material alternation of an electronic image of a truncated cheque. Availability of adequate technical infrastructure at cleaning houses and banks is a prerequisite for expanding the network and exploiting the full benefits of cheque-imaging.

5.15.2 Real-time Gross Settlement—(RTGS)

It is a payment mechanism that eliminates settlement risk by settling payments in real time. This is in contrast to the existing net settlement system, where interbank settlement takes place at the end of the batch.

Notes

The RBI has implemented a national RTGS system that allow all bank in India to make secure inter-bank payments across the country. The RTGS work flow involve transaction queeing and processing on a first-in-first out basis. RTGS provide significant benefits to individuals and businesses by allowing instant transfer of funds between banks thus expediting electronic payments.

5.15.3 Integration with Enterprise Resource Planning System (ERP)

Organisation are migrating from their existing accounting procedures to enterprise resource planning system. This has fuelled the need to integrate the banks cash management systems with corporates *ERP packages and key cash management providers now offer complete integration of cash management solution with ERP system. Such integration offers the following benefits—

(*a*) reduces manual processing and cost thereof

(*b*) enables comprehensive management control by setting user restrictions.

(*c*) streamlines the reconciliation process.

(*d*) improves management information

(*e*) allows straight-through processing (STP)

Straight-through processing (STP) has historically been regarded as an area focused on by banks for streamlining their processes. Corporates now appreciate the role of STP as an integral part of their internal accounting work flows. Manual practices involve costly multiple data re-entry from paper documents and other sources that are susceptible to errors, discrepancies, delays and possible fraud. STP enables orders to be processed, confirmed, cleaned and settled in a shorter-time period, more cost effectively and with fewer errors.

5.15.4 Electronic Banking

The Government has supported the growth of e-commerce in India by enacting the Information Technology Act 2000. There are more people connected to the Internet in India today than in past owing to improving personal computer penetration, availability of brand width and power.

However, despite the growing internet population, India is still witnessing modest* e-commerce activity. E-commerce activity was estimated to be in the region of about US$ 300 m, almost half that of China. Business-to-business e-commerce implementation is low-except in certain verticals such as the automobile sector and banking and finance.

With recent technological advancements, the implementation of Internet banking and electronic banking has increased greatly. The private sector and foreign banks in India are at the forefront in offering online banking services on internet. This service is in addition to existing offsite delivery channels such as automated letter machines, electronic banking and mobile banking. Reports for the collections products are being offered on the internet by

selected banks. Customers can now view the clearing status of their cheques and cheque images over the internet.

Going forward, the utilization of electronic banking will further increase as technological advances and enabling legislation make the process more secure.

Notes

5.16. REGULATORY CHANGES AND THEIR IMPACT ON CASH MANAGEMENT

5.16.1 Information Technology Act 2000

Business and consumers are increasingly using computers to create, transmit and store information in electronic format instead of traditional paper documents.

Since e-commerce eliminates paper based transactions the need for legal changes became a necessity. The Indian Parliament gave its assent to the Information Technology Act on 9 June 2000.

The Act deals with defining the common terminology used in respect of computers, giving legal recognition to electronic records and digital signatures. The act further defines when digital signatures or electronic records can be termed secure for transmission over the internet.

The government has also framed the Information Technology (Certifying Authority) Regulations 2001. This regulation primarily controls the activities of certifying authorities (authorised to grant licences to issue digital signatures).

India now has four certifying authorities *i.e.,*

(*a*) Safe Scrypts

(*b*) The National Information Centre

(*c*) Institute for Development and Research in Banking Technology (IDRBT)

(*d*) Tata Consultancy Services

5.16.2 Centralized Funds Management Service

The Centralized Fund Management Service (CFMS) introduced by the RBI, enables commercial banks to obtain the funds position of their accounts with the RBI's Deposits Accounts Department (DAD) at 17 locations in India.

Bank will not only be able to enquire about their funds balance in DAD accounts, but also transfer funds across their DAD accounts in different cities. CFMS allows banks to reduce their cost of fund by better management of fund flows.

5.16.3 Clearing Corporation of India LTD

Recognised the need for upgrading the country's financial infrastructure in respect of the clearing and settlement of debt instruments and Fx (FOREX) transactions, the RBI initiated the more to set up the Cleaning Corporation

of India Limited (CCIL). The primary objective of setting up the CCIL has been to establish a safe institutional structure for the clearing and settlement of trades in Fx money, and debt markets so as to bring efficiency into the transaction settlement process, and insulate the financial system from stocks emanating from operations-related issues. The CCIL was incorporated in 2001 and commenced operations from 15 Feb. 2002.

5.16.4 Structured Financial Messaging Solution

The Structured Financial Messaging Solution (SFMS) is the communication protocol introduced by the RBI for intra-bank and inter-bank messages within India.

It incorporates templates and fixed message formats for affecting STP among member banks SFMS is broadly similar to SWIFT message formats. These message formats will be used for RTGS and other interbank communication.

SFMS protocols will facilitate STP in the Indian banking industry for domestic payments and transactions, reducing transaction costs for customers.

5.16.5 Latest Cash Management Products

In India Cash Management has predominantly been associated with collections products. Subsequently, cash management provides have diversified their product portfolio to include payments, account services and delivery management. This enables corporate treasurers to concentrate on their core functions and outsource non-core activities to banks. Banks are increasingly shifting towards enabling their cash management operations to use more STP.

5.16.6 Electronic Fund Transfer

The RBI introduced the Electronic Fund Transfer (EFT) system in 2001. EFT allows the electronic transfer of funds across 14 locations and 13,000 banks branches in India. It eliminates the burden of writing cheques and allows the transfer of funds within 24 hours anywhere within its current coverage.

The system eliminates virtually all incidences of fraud and forgery that are typically involved with paper-based instruments.

Current RBI guidelines for EFT stipulate that all banks have to participate in inward EFT (credit to customer's accounts for EFT payments). But participation in outward EFT (sending payments on behalf of customers) is optional.

5.16.7 Special Electronic Funds Transfer

In April 2003 the RBI introduced the special electronic funds transfer (SEFT) system, which is the enhanced version of EFT. SEFT now covers 97 cities, 24 banks and 2,500 bank branches across India.

Notes

The coverage of SEFT is much larger than that offered by EFT. SEFT gives banks the options to select branches where they can offer SEFT. All branches that participate is SEFT need to be networked with the service branch in Mumbai, which intact as the one point of contact with the RBI for SEFT.

Since, all banks branches participating is SEFT are networked, timely credits will be available to beneficiaries (unlike for EFT, wherein there is a possibility of delayed credit of the beneficiary bank is not networked).

5.16.8 Payment Outsourcing

Cheque and drafts remain a popular payment method in India, but involve time-consuming and laborious manual processes. Payment outservicing to banks allows corporates to focus on their core competencies, reduce overheads costs and benefit from speed, accuracy and enhanced security and fraud control.

5.16.9 Electronic Invoice Presentment & Payment

Cash management providers in India have started offering electronic invoice presentment and payment (EIPP).

EIPP offers the facility of presenting the invoice by supplier to their client over the internet. The product also provides the facility to the client to view, dispute and pay the invoice electronically through payment gate ways.

5.16.10 Continuous Linked Settlement

The Continuous Linked Settlement (CLS) service offered by CLS Bank provides a global infrastructure for multi-currency payment cleaning and settlement services. It is a real-time cross broader settlement system that eliminates settlement risk caused by delay arising from time-zone difference by the simultaneous setting of Fx payment instructions.

CLS enables banks to expand their Fx businesses with CLS participating comtemporary banks by making its possible to increase limits due to reductions in settlement risk moreover its delivers the benefits of STP.

Large foreign banks that are settlement bank for CLS have been marketing the service to major Indian banks with cross-border flows. However CLS has yet to gain momentum in India.

5.17. CASH MANAGEMENT TRENDS

The overall cash management scenario is changing with technological advance and evolving customer needs. STP facilitates by the integration of bank's cash management solutions with corporate's ERD system, is gaining importance.

Electronic banking access on the internet with account viewing and transaction-initiation capabilities is increasingly critical for technology - Savvy customers. The emerging technologies and the payment system will

Notes

significantly impact the corporate treasurer's agenda. New strategies for effective cash management will soon emerge in the Indian Market.

In view of the geographic diversity of India, key cash management providers are strengthening their correspondent banking relationships to reduce transaction costs, enhance location coverage and improve service quality.

The new payment system also pose significant challenges for cash management service providers and will require banks to make a shift in terms of earnings (from float to fees) as well as service offerings.

5.18. ILLUSTRATIONS

1. From the following information compute
   (*a*) Cash cycle and cash turnover
   (*b*) Minimum amount of cash to be maintained to meet payments as they become due.
   (*c*) Savings by reducing the average inventory holding period by 30 days,
      (*i*) On an average, debtors are collected after 45 days.
      (*ii*) Inventories have an average holding period of 75 days,
      (*iii*) Creditors payment period on an average is 30 days.
      (*iv*) The firm spends Rs. 120 lakh annually at a constant rate
      (*v*) It can earn 10% an investment.

Solution:

(*a*) (*i*) Cash cycle = debtors collection period + inventories holding period – creditors payment period

= 45 + 75 – 30 = 90 days = 3 months

(*ii*) Cash turnover = 120 months/3 months = 4

(*b*) Minimum operating cash = Total operating annual outlay/cash turnover

= 120 lakh/4 = ₹ 30 lakh

(*c*) Cash cycle = 45 days + (75 – 30) – 30

= 45 + 45 – 30 = 90 – 30 = 60 days

= 2 months

Cash turnover = 12 months/2 months = 6

Minimum operating cash = 120 lakhs/6 = ₹ 20 lakhs

Reduction in investment = 30 lakhs – 20 lakhs = 10 lakhs

Saving 10% × 10 lakhs = ₹ 1 lakh.

2. Firm XYZ Ltd. has been offered a cash management service by a bank for ₹ 1,00,000/ annum.

Notes

It is estimated that such a service would not only eliminate 'excess' cash on deposits (₹ 8,00,000) but also reduce its administration and other costs to the tune of ₹ 5,000/months. If the cost of capital is 15%, is it worth for the firm to engage the cash management service advice?

Solution: Benefit (annual)

	₹
Savings in interest (8,00,000 × 0.15)	1,20,000
Reduction in administration and other costs (5000 × 12)	60,000
Total	1,80,000
(–) annual cost of bank	1,00,000
Net annual benefits	80,000

As the savings are ₹ 80,000 by employing the bank services hence, it is to be accepted.

3. Rama industries feels a lock-box system can shorten its accounts receivable collection period by 3 days. Credit sales are estimated as ₹ 365 lakh/year. The opportunity cost of fund is 15%/annum. The cost of lock-box system is ₹ 50,000/annum.

(*a*) will you advice to go for lock-box system?

(*b*) will your advice change if the accounts receivable period is reduced by 5 days?

Solution:

(*a*) Cash released by lock-box system = 365/365 days × 3

	₹
=	3,00,000
Savings (₹ 3 lakhs × 0.15)	45,000
(–) cost of lock box system	50,000
Net (loss)	₹ 5,000

The firm is not advised to go for lock-box system because it is leading to a loss of ₹ 5000/annum.

(*b*)

		₹
Cash released (₹ 365/365 × 5 day)	=	5,00,000
Saving (5 lakh × 0.15)	=	75,000
(–) cost of lock-box system	=	50,000
	=	25,000

In this situation if the accounts receivable collection period is reduced by 5 days then firm saves an amount of ₹ 25,000. Hence it is recommended to go for lock-box system.

4. M/s Das Distribution Network sells its products through a wide network of customers in the eastern India. It takes as an average of 8 days for cash receipt cheques to become available to the firm from the day these are mailed. The firm is contemplating the institution of concentration banking to reduce this period. It is estimated that with this system the collection period of accounts receivable will

Notes

reduce by 3 days. The daily cheque receipts currently average to ₹ 10,00,000. The concentration banking would cost ₹ 1,50,000/ annual the cost of capital is 15%.

(*a*) Advice the firm whether it should opt for concentration banking system.

(*b*) Will your advice be different, if it is estimated that a lock-box system can reduce the collection, time by 4 days and its annual cost is ₹ 2,00,000.

Solution:

(*a*) Cash released by concentration banking system ₹ 10 lakh × 3 = 30 lakh.

Saving (30 lakh × 0.15)	4,50,000
(–) cost of concentration banking	1,50,000
	3,00,000

As the savings are a huge amount *i.e.*, ₹ 3,00,000 hence firm should go for the concentration banking system.

(*b*) Cash released by lock-box system

₹ 10 lakh × 4 = ₹ 40 lakh

Savings (40 lakh × 0.15)	6,00,000
(–) cost of lock-box system	2,00,000
	4,00,000

In the case of concentration banking there is a saving of ₹ 3,00,000 whereas in the case of lock-box system saving has increased from ₹ 3,00,000 to ₹ 4,00,000. Hence in second case that is lock-box system is more suitable for the organisation. The firm must go for the lock-box system instead of concentration banking system.

5. From the following information, prepare cash budget of a business firm for the month of April.

(*a*) The firm makes 20% sales in cash.

(*b*) Credit sales are collected 40, 30 and 25% in the month of sales, month after and 2nd month after sales respectively.

(*c*) Remaining 5% is bad debts.

(*d*) The firm has a policy of buying enough goods each month to maintain its inventory at $2\frac{1}{2}$ times the following months budgeted sales.

(*e*) The firm is entitled to 2% discount on all its purchases if bills are paid within 15 days and the firm avails of all such discounts.

(*f*) Monthly purchases are made in two equal lots on fortnightly basis.

(*g*) Cost of goods sold, without considering 2% discount is 50% of selling prices.

(*h*) The firm records inventory net of discount,

(*i*) Other data are as below

	₹
(*i*) January (actual)	1,00,000
(*ii*) February (actual)	1,20,000
(*iii*) March (actual)	1,50,000
(*iv*) April (budgeted)	1,70,000
(*v*) May (budgeted)	1,40,000

(*j*) Inventory on March 31 is ₹ 2,25,400

(*k*) Cash on March 31 is ₹ 30,000

(*l*) Gross purchases in March is ₹ 1,00,000

(*m*) Selling, general and administrative expenses budgeted for April ₹ 45,000 including ₹ 10,000 depreciation.

Solution: Cash budget for the month of April.

Particulars		**Amount in ₹**
(*a*) Cash inflows		
Balance in the beginning of April		30,000
Collection from sales –		
Cash sales (20% of 1,70,000)		34,000
Collection from debtors –		
for February sales – (0.25 × 96,000)		24,000
for March sales (.30 × 1,20,000)		36,000
for April sales (.40 × 1,36,000)		54,400
Total		1,78,400
(*b*) Cash outflows		
Payment for purchases		
March (₹ 1,00,000 × 0.98 × 1/2)		49,000
April (₹ 29,400 × 1/2)*		14,700
selling, general and admin, expenses (45,000 – 10,000)		35,000
Total		₹ 98,700
(*c*) Budgeted cash balance (*a* – *b*)		₹ 79,700
*Purchase budget (April)	Gross	Net
desired ending inventory gross (1,40,000 × 0.5 × 2.5)	1,75,000	1,71,500
(+) cost of sales in April gross. (1,70,000 × 0.5)	85,000	83,300
Total requirements	2,60,000	2,54,800
(–) beginning inventory gross (2,25,400 × 100/98)	2,30,000	2,25,400
Required purchases	30,000	29,400

Notes

Notes

5.19. SUMMARY

- Management of cash is an important function of finance manager. The modern day business comprises of numerous units spread over vast geographical areas.
- The basic objectives of cash management are two folds.
  (*a*) to meet the cash disbursement needs i.e., payment schedule.
  (*b*) to minimise funds committed to cash balances.
- The factors that determine the required cash balance are
  (*a*) Synchronization of cash flow
  (*b*) Short costs
  (*c*) Excess cash balance cost
  (*d*) Procurement and management
  (*e*) Uncertainty
- There are two approaches to derive an optimal cash balance. These are
  (*a*) Minimising cost cash models
  (*b*) Cash budget
- Cash budget represents cash requirements of business during the budget period. It is the plan of receipts and payments and payments of cash during the budget period. Cash budget can be prepared for short period or for long period.
- Long range cash forecast often resemble the projected service and application of funds statement.
- An important reason for maintaining cash balances is the transaction motive. This refers to the holding of cash to meet routine cash requirements to finance the transactions which a firm carries on in the ordinary course of business.
- Another motive to hold cash balances is to compensate banks for providing certain services and loan.
- Cash budget gives the net cash position of a firms. After knowing the cash position the management should work out on the basic strategies to be employed to mange its cash.
- The higher is the cash turnover the lesser is requirement of cash in a firm. Therefore firm should try to minimise the cash turnover. But must maintain a minimum amount of operating cash balance so that it does not run out of cash.
- The strategic aspects of efficient cash management are—efficient inventory management, speedy collection of accounts receivable and delaying payments on accounts payable.
- Once the optimum level of cash balance of a firm has been determined, the residual of its liquid assets is invested in marketable securities.
- A major decision confronting the financial managers involves the determination of the mix of cash and marketable securities.
- With reference to marketable securities portfolio liquidity refers to the ability to transform a security into cash.
- Following are the prominent marketable/near-cash securities.

1. Treasury bills
2. Negotiable certificates of deposits (CDs)
3. Commercial papers
4. Banker's acceptances
5. Repurchase agreements
6. Units
7. Intercorporate Deposits
8. Bills discounting
9. Call market

- The overall cash management scenario is changing with technological advance and evolving customer needs.

Notes

5.20. SELF-HELP QUESTIONS

1. What are the principal motives for holding cash?
2. What are the objectives of cash management?
3. Briefly explain the factors that determine the cash need of a firm with the help of example.
4. Discuss the utility of cash budget as a tool of cash management. What are the steps involved in the construction of cash budget.
5. What are the basic strategies of efficient cash management? Explain with suitable examples the effect of these on the operating cash requirements of a firm.
6. What is the significance of speedy receivables collection? In this content briefly explain concentration banking and lock-box system.
7. Write short-notes on:
   (*i*) Strategies to slow disbursements of accounts payable
   (*ii*) Deposit float and payment float.
8. With the help of following informations
   (*a*) Prepare a monthly cash budget for six months *i.e.*, July to December
   (*b*) An estimate of excess cash or shortage of cash for each month.

Information

(*i*) Sales forecast

May	₹ 75,000,	June	75,000	July	1,50,000		
Aug.	2,25,000,	Sep.	3,00,000	Oct.	1,50,000	Nov.	1,50,000
Dec.	1,37,500	Jan.	75,000				

(*ii*) Raw materials

May	₹ 37,500,	June	37,500,	July	52,500,	Aug.	3,67,500
Sep.	1,22,500,	Oct.	97,500,	Nov.	67,500,	Dec.	37,500

Notes

(iii) Collection estimates

(a) Within the month of sale – 5%

(b) During the month following sales – 80%

(c) During the 2nd month following sales – 15%

(ii) Payment of raw materials

During the month following the month in which purchase take place.

(v) Miscellaneous

(a) General and administrative salary – ₹ 11,250/month

(b) Monthly base payment – ₹ 3,750

(c) Monthly depreciation charges – ₹ 15,000

(d) Monthly miscellaneous expenses – ₹ 1,150

(e) Income tax ₹ 26,500 in Sep. and December

(f) Payment for research in Oct. ₹ 75000

(g) Opening balance of cash in July 1 - ₹ 55000

(h) Minimum cash balance of ₹ 37,500 throughout the cash budget period.

9. Following informations are available in respect of M/s. Gopal Das and Co.

(i) Materials are purchased and received one month before being used and payment is made to supplier after 2 months of materials receipts.

(ii) Cash is received from customers 3 months after finished goods are sold and delivered to them.

(iii) No time lag applies to payment of wages and expenses.

(iv) Cash balance at the beginning of April – ₹ 10,000

(v) All products are sold immediately after these are produced.

(vi) Materials used and sums spent on wages and expenses during any particular month relate strictly to the sales made during that month.

(vii) Following figures apply to recent and future months

Month	Material Received (₹)	Sales (₹)	Wages and Expenses (₹)
Jan	20,000	30,000	9,500
Feb	22,000	33,000	10,000
Mar	24,000	36,000	10,500
Apr	26,000	39,000	11,000
May	28,000	42,000	11,500
June	30,000	45,000	12,000
July	32,000	48,000	12,500
Aug	34,000	51,000	13,000

Prepare cash flow forecast month by month from April to July.

Notes

10. Prepare a cash budget of ABC Ltd for the 6 months commencing April on the basis of the following information.

(*i*) Cost and prices remains unchanged.

(*ii*) Cash sales are 25% of the total sales and balance 75% are credit sales.

(*iii*) 60% of credit sales are collected in the month following the sales, balance 30% and 10% in the two following months respectively.

(*iv*) No bad debts are anticipated.

(*v*) Gross profit margin is 20%

(*vi*) Interest @ 67 on debentures of ₹ 20,00,000 is paid quarterly and is payable in June and September every year.

(*vii*) Excise deposit due in July ₹ 2,00,000.

(*viii*) Capital expenditure for plant and machinery planned for September ₹ 1,20,000.

(*ix*) Company has a cash balance of ₹ 4,00,000 as at March 31. This is the minimum desired cash balance per month.

(*x*) Company can barrow on monthly basis ignoring interest on borrowing.

(*xi*) Rent is ₹ 8000/month.

(*xii*) Sales forecosts (₹) Jan -12,00,000, Feb -14,00,000

March –16,00,000,	April – 6,00,000,	May – 8,00,000
June – 8,00,000,	July – 12,00,000,	Aug – 10,00,000
September – 8,00,000,	October – 12,00,000	

(*xiii*) Purchases (anticipated) – (₹)

April – 6,40,000,	May – 6,40,000,	June – 9,60,000,
July – 8,00,000,	Aug – 6,40,000,	September – 9,60,000

(*xiv*) Wage and salaries to be paid (₹)

April – 1,20,000,	May – 1,60,000,	June – 2,00,000,
July – 2,00,000,	August – 1,60,000,	September – 1,40,000

11. Following informations are available in respect of a firm.

(*i*) On an average, accounts receivable are collected after 80 days,

(*ii*) Inventories have an average of 100 days.

(*iii*) Accounts payable are paid approximately 60 days after they arise.

(*iv*) Firm spends a total of ₹ 1,81,20,000 annually at a constant rate.

(*v*) It can earn 8% on investments.

Calculate

(*a*) Cash cycle and cash turnover

(*b*) Minimum amount of cash to be maintained to meet payments as they become due.

Notes

(c) Savings by reducing the average age of the inventories to 70 days.

12. A firm uses a continuous billing system instead of centralised billing and collection. It is estimated that such a system would replace the collection period of accounts receivable by 4 days. The average daily receipt is ₹ 20,00,000. Concentration banking would cost of ₹ 1,00,000 annually and 10% can be earned by the firm on its investment.

    It is also found that a lock-box system could reduce its overall collection time by 8 days and would cost ₹ 2,50,000 annually.

    (a) How much cash would be released with the concentration banking system?

    (b) How much can be saved due to reduction in collection period by 4 days?

    (c) Should firm go for the centralised banking.

    (d) How much cash will be freed by the lock-box system.

    (e) What will be the saving with lock-box system.

    (f) Among centralised banking and lock-box system, which system is most suitable for the firm and why?

13. If the cash turnover rate of a firm is 5, annual cash outflow is ₹ 1,75,000, and accounts payable can be stretched by 20 days. What will be the impact of stretching accounts payable on the minimum operating cash requirement. What would be saving on cost?

    Hint. (assume - firm can earn 8% on its investments)

BBA-604

सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामयाः !
सर्वे भद्राणिः पश्यन्तु माकश्चिद् दुःख भाग्भवेत् !!

Directorate of Distance Education

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

UGC Approved Meerut

Where Education is a Passion...

NAAC A

Subharti Puram, N.H.–58, Delhi-Haridwar By Pass Road,
Meerut, Uttar Pradesh 250005

Website: www.subhartidde.com , E-mail: ddesvsu@gmail.com