

LIQUIDITY AND WORKING CAPITAL MANAGEMENT



Liquidity and working capital management imply the short-term management of a firm, which are very vital for maintaining adequate but not excessive liquidity for the firm. The holding of current or liquid assets, especially cash, reduces the profitability of the firm; since cash is an unproductive asset. The firm has a greater degree of flexibility in managing current assets. Hence for maintaining proper liquidity of a firm; liquidity and working capital management play the pivotal role. Liquidity and working capital management discussed in **UNIT#FIVE** mainly include the following: -

1. Working Capital Management Policy (Lesson:1)
2. Working Capital Investment Policy (Lesson:2);
3. Working Capital Financing Policy (Lesson:3);
4. Working Capital Planning (Lesson:4)
5. Cash Management (Lesson:5)
6. Inventory Management Principles (Lesson:6);
7. Inventory Management: Elements & Techniques (Lesson:7)
8. Accounts Receivable Management and Factoring (Lesson: 8);
9. Marketable Securities Management (Lesson:9)
10. Short-term Financing. (Lesson:10)

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Lesson-1: Working Capital Management Policy

After careful reading of the lesson 1, you should be able -

- To grasp the concepts working capital and its relation with management policies;
- To understand the concept of working capital management policies;
- To identify the goals of working capital management policies and
- To realize the significance of working capital management policies.

Concepts of Working Capital and Its Relation with Management Policies

There are two concepts of working capital – gross and net.

- **Gross working capital** refers to the firm's investment in current assets. Current assets are the assets which can be converted into cash within an accounting year (or operating cycle) and include cash, short-term securities, debtors, (accounts receivable or book debts) bills receivable and stock (inventory).
- **Net working capital** refers to the difference between current assets and current liabilities. Current liabilities are those claims of outsiders which are expected to mature for payment within an accounting year. The examples are accounts payable, bills payable, bank overdrafts, bank loans and outstanding expenses. Net working capital may be positive or negative. A positive net working capital will arise when current assets exceeds current liabilities. A negative net working capital will occur when current liabilities exceed current assets.

It may be emphasized that both gross and net concepts of working capital are equally important for the efficient management of working capital. There is no precise way to determine the exact amount of gross or net working capital for any firm. The data and problems of each firm should be analyzed to determine the same.

The need for working capital to run the day-to-day business activities cannot be overemphasized. We will hardly find a business firm which does not require any amount of working capital. Indeed, firms differ in their requirements of the working capital. We know that a firm should aim at maximizing the wealth of its shareholders. In its endeavor to do so, a firm should earn sufficient return from its operations. Earning a steady amount of profit requires successful sales activity. The firm has to invest enough funds in current assets for generating sales. Current assets are needed because sales do not convert into cash instantaneously.

Working capital management refers mainly to the planning and control of working capital.

By working capital management principles we mean the principles followed in managing working capital. Working capital management refers mainly to the planning and control of working capital. By planning working capital we mean determination of working capital needs. By control of working capital we mean the proper utilization of working capital. The term working capital policy refers to the decisions regarding :(i) the target levels for each current asset account and (ii) how current assets will be financed. Therefore, working capital management policies are mainly divided into two groups namely, working investment policy and working financing policy.

The term working capital originated with the old Yankee Peddler, who would load up his wagon with goods and then go off on his route to paddle his wares. The merchandise was called working capital because it was what he actually sold to earn profits. The wagon and horse were his fixed assets. To buy the merchandise he borrowed fund which was known as working capital loans that had to be repaid after each trip.

Concept of Working Capital Management Policies

Working capital management should aim at striking a balance between profitability and liquidity of the firm.

Working capital management is concerned with the problems that arise in attempting to manage the current assets, the current liabilities and the interrelationships that exist between them. The term current assets refers to those assets which in the ordinary course of business can be converted into cash within one year without undergoing a diminution in value and without disrupting the operations of the firm. The examples of current assets are cash in hand, cash at bank, accounts receivables, inventory, marketable securities, bills receivable and prepaid expenses. Current liabilities are those liabilities, which are intended at their inception to be paid in the ordinary course of business, within a one year, out of the current assets or earnings of the business. The basic current liabilities are accounts payable, bills payable, cash credit, bank overdraft and outstanding expenses. One of the main features of managing current assets is the question of profitability vs. liquidity and related aspect of risk. If the size of current assets is large, the liquidity position would improve no doubt, but profitability would be adversely affected since the funds will remain idle. On the other hand, if the size of such assets is relatively small, the overall profitability will undoubtedly increase, but it will have an adverse effect on the liquidity position, thereby making the firm more risky. Therefore, working capital management should aim at striking a balance between profitability and liquidity of the firm.

Goals of Working Capital Management Policies

The interaction between the current asset and current liabilities should be the main theme of the working capital management.

The goal of working capital management is to manage the firm's current assets and current liabilities in such a way that an optimum level of working capital is maintained. This is because of the fact that if the firm fails to maintain a satisfactory level of working capital, it is likely to become financially insolvent and even may 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

the firm while not keeping too high or too low any one of them. Again, each of the current liabilities must be effectively managed to ensure that the short-term sources are obtained and used in the best possible manner. Therefore, the interaction between the current asset and current liabilities should be the main theme of the working capital management.

The firm's policies for managing its working capital should be designed to achieve three goals such as maintenance of adequate liquidity; minimization of risks and maximization of the value of the firm through its profit and wealth maximization. If a firm lacks sufficient cash to pay its bills when due, it will experience continuing problems. Therefore, the most important goal is to achieve and also maintain adequate liquidity for the conduct of day-to-day operation. The matching of assets and liabilities among current accounts is a task of minimizing the risk of being unable to pay bills and other obligations. The investment of surplus cash, minimizing of investment in inventory and receivable, speedy collection of receivable and elimination of unnecessary and costly short-term financing, all contribute to maximizing wealth, profit and in turn the value of a firm.

Significance of Working Capital Management Policies

A firm's profitability is determined in part by the way its working capital is managed. That is, when working capital varies in relation to sales without a corresponding change in production, the profit position is affected. Moreover, if the flow of funds created by the movement of working capital through the various business processes is interrupted, the turnover of working capital is decreased, as is the rate of return on investment. It is, therefore, important for the financial management of an enterprise to pay particular attention to the planning and control of working capital.

The relative amount that is invested in short-term assets is a function of decisions that are made concerning the management of cash and marketable securities, accounts receivable and inventories. Of these three assets we generally consider cash and marketable securities to be the least risky, or most liquid. But the degree of risk can vary for either accounts receivable or inventories, depending on the general characteristics of the firm's working capital policy. For example, we generally view receivables as relatively safe assets because they represent sales the firm expects to collect in the future. But a firm with an overly aggressive, or relaxed, credit policy might have many slow payers or bad-debt customers that make its receivables extremely risky, thus fairly liquid.

Thus, all else equal, firms that hold greater amounts of short-term assets are considered less risky than firms that hold greater amounts of long-term assets; at the same time, firms with more short-term assets earn lower returns than firms with more long-term assets. Consequently, financial managers are faced with a dilemma of whether to forgo higher returns to attain lower risk or to forgo lower risk to achieve higher returns. In general, however, we will see that some amount of short-term assets is

required to maintain normal operations. Therefore, the question of trade-off between profitability and risk is very much important in working capital management principles.

Trade-off between Profitability and Risk

In evaluating a firm's net working capital position, an important consideration is the trade-off between profitability and risk. In other words, the level of net working capital has a bearing on profitability and risk. The term risk is defined here as the probability that a firm will become technically insolvent so that it will not be able to meet its obligation when they become due for payment.

The risk of becoming technically insolvent is measured using net working capital (NWC). It is assumed that the greater the amount of NWC, the less risk prone the firm is, or the greater the NWC, the more liquid the firm is. Therefore, the less likely it is to become technically insolvent. Contrary, lower levels of NWC and liquidity are associated with increasing levels of risk. The relationship between liquidity, NWC and risk is such that if either NWC or liquidity increases, the firm's risk decreases and vice-versa.

Nature of Trade-off

If a firm wants to increase its profitability, it must also increase its risk. On the hand, if it is to decrease risk it must decrease profitability. The trade-off between these variables is that regardless of how the firm increases its profitability through the manipulation of working capital, the consequence a corresponding increase in risk as measured by the level of NWC.

In evaluating the profitability – risk trade-off related to the level of NWC, three basic assumptions, which are generally true, are as follows:

- (i) That the firm is a manufacturing one
- (ii) That current assets are less profitable than the fixed assets
- (iii) That the short-term funds are less costly than the long-term funds.

In reality, the principal reason for the failure of the firms is that they are unable to meet their working capital requirements. Thus, sound working capital management policy is a pre-requisite for the survival of a firm. Therefore, much of the financial manager's time is devoted to working capital management and many of you who get jobs in financial areas will find your first assignment on the job would involve working capital. For these reasons, working capital management policy is very essential.

Review Questions

A. Short Questions

1. Define working capital and working capital management.
2. What is a working capital policy? Explain with examples.
3. Examine the nature of working capital management policy.
4. What is the goal of working capital management policy? Discuss.

B. Broad Questions

5. Discuss the significance of working capital management policy in case of a manufacturing enterprise.

Lesson-2: Working Capital Investment Policy

After careful study of the lesson 2, you should be able -

- To understand the concept and the significance of working capital investment policy;
- To know the cash conversion cycle and its various stages and
- To identify and discuss the types of working capital investment policies.

Concept and Significance of Working Capital Investment Policy

The allocation of total working capital in its various components is known as working capital investment policy.

Working capital investment policy refers to the determination of the amount of working capital to be invested in various current assets namely, cash and bank balances, inventory, accounts receivables, bills receivables, marketable securities and prepaid expenses. That is, the allocation of total working capital in its various components is known as working capital investment policy.

Determination of correct amount of investment in current assets is significant for any manufacturing firm. The level of investment in current assets should be neither excessive nor inadequate; but should be reasonable. Therefore, investment in current assets should be just reasonable, not more or not less to the needs of the business firms. Both the excessive investment and the inadequate investment in current assets should be avoided because they impair the firm's profitability and liquidity. Excessive investment leads to blockage of funds in current assets which earns nothing since it is an idle investment. On the other hand, inadequate investment in current assets can threaten the liquidity as well as solvency of the firm because of its inability to meet its current financial obligations. It should be kept in mind that working capital needs of the firm may fluctuate with changing business activities. This may cause excessive or inadequate investment in current assets frequently. In such a situation the financial management should take initiative to correct the imbalances. Here lies the importance of proper current assets investment policy for the firms.

Cash conversion cycle refers to the length of time from the payment for the purchase of raw materials and supplies to manufacture a product until the collection of accounts receivables created by credit sale of the products.

Cash Conversion Cycle and Its Various Stages

Cash conversion cycle refers to the length of time from the payment for the purchase of raw materials and supplies to manufacture a product until the collection of accounts receivables created by credit sale of the products. There are five important processes involved in cash conversion cycle which are summarized as follows:

- (i) Purchasing raw materials and supplies on credit, thereby creating accounts payable. Such purchases have no immediate cash flow effect because payment is not made at the time of purchases.
- (ii) Labor and other factory expenses are used to convert the materials into the finished products.

- (iii) The finished products are sold on credit, thereby creating accounts receivables. Such sales have no immediate cash inflows to the business.
- (iv) Later on, the question of paying off accounts payable and other accrued operating costs like wages and factory overheads arises which involves cash outflows.
- (v) The last process arises when the question of collection from accounts receivables arises. This leads to cash inflows in the business.

There are three important stages of a cash conversion cycle namely, the inventory conversion period, receivables collection period and the payables deferral period. The following paragraphs deal with the following stages:

- (i) **The Inventory Conversion Period:** The inventory conversion period is the average length of time required to convert materials into finished goods and then to sell those goods? It is the amount of time the product remains in inventory in various stages of completion. The inventory conversion period is calculated by dividing inventory by the cost of goods sold per day.
- (ii) **The Receivables Collection period:** It is the average length of time required to convert the firm's receivables into cash – that is, to collect cash following a sale. The receivables collection period also is called the day's sales outstanding (DSO), and it is calculated by dividing accounts receivable by the average credit sales per day.
- (iii) **The Payable Deferred Period:** It is the average length of time between the purchase of raw materials and labor and the payment of cash for them. It is computed by dividing accounts payable by the daily credit purchases.

The cash conversion cycle computation nets out the three periods just defined, resulting in a value that equals the length of time between the firm's actual cash expenditure to pay for (invest in) productive resources (materials and labor) and its own cash receipts from the sale of the products that is, the length of time between paying for labor and materials and collecting on receivables. The cash conversion cycle thus equals the average length of time a Taka is tied up in current assets. Therefore, the formula for finding out cash conversion cycle goes as follows :

The cash conversion cycle thus equals the average length of time a Taka is tied up in current assets.

$$\left(\begin{array}{c} \text{Cash} \\ \text{conversion} \\ \text{cycle} \end{array} \right) = \left(\begin{array}{c} \text{Inventory} \\ \text{conversion} \\ \text{period} \end{array} \right) + \left(\begin{array}{c} \text{Re ceivables} \\ \text{collection} \\ \text{period} \end{array} \right) - \left(\begin{array}{c} \text{Payables} \\ \text{deferred} \\ \text{period} \end{array} \right)$$

Types of Investment Policy

There are three alternative policies regarding the total amount of current assets carried. Essentially, these policies differ in that different amounts

of current assets are carried to support any given level of sales. These policies are –

1. Relaxed Current Investment Policy: A policy under which relatively large amounts of cash and marketable securities and inventories are carried and under which sales are stimulated by a liberal credit policy that results in a high level of receivables.

2. Restricted Current Asset Investment Policy: A policy under which holdings of cash and marketable securities, inventories, and receivables are minimized.

3. Moderate Current Assets Investment Policy: A policy that is in between the relaxed and restrictive policies.

In terms of the cash conversion cycle, a restricted investment policy would tend to reduce the inventory conversion and receivables collection periods, which would result in a relatively short cash conversion cycle. Conversely, a relaxed policy would create higher levels of inventories and receivables, longer inventory conversion and receivables collection periods, and a relatively long cash conversion cycle. A moderate policy would produce a cash conversion cycle somewhere between the two extremes.

The following Figure presents the alternative current assets investment policies of a corporate firm.

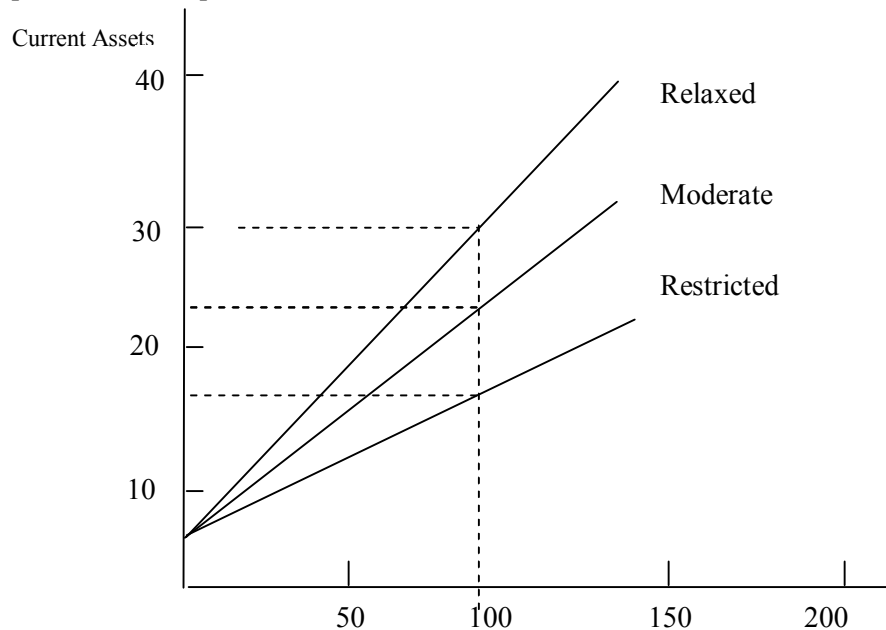


Figure – 28.1 : Alternative Current Asset Investment Policies (millions of dollars)

Summary of Figure 1:

	Sales (\$)
Policy	Current Assets to Support Sales of \$100
Relaxed	\$30
Moderate	23
Restricted	16

Problems and Solutions

Problem - 1

The following data relate to a manufacturing company during 2003-2004:

Credit sales-Tk. 4,50,000; Credit purchase –Tk. 3,80,000; Finished Inventory –Tk. 90,000; Cost of goods sold – Tk. 60% of total sales of Tk. 6,00,000 and Accounts payable –Tk. 1,45,000.

Calculate cash conversion cycle of the company. Also determine Net Working Capital of the company.

Solution

$$\left(\begin{array}{c} \text{Cash} \\ \text{conversion} \\ \text{cycle} \end{array} \right) = \left(\begin{array}{c} \text{Inventory} \\ \text{conversion} \\ \text{period} \end{array} \right) + \left(\begin{array}{c} \text{Receivables} \\ \text{collection} \\ \text{period} \end{array} \right) - \left(\begin{array}{c} \text{Payables} \\ \text{deferred} \\ \text{period} \end{array} \right)$$

$$(i) \text{ Inventory Conversion Period} = \frac{\text{Finished Inventory}}{\text{Cost of goods sold per day}}$$

$$= \frac{90,000}{60\% \text{ of } 6,00,000/360}$$

$$= \frac{90,000}{1,000} = \underline{90 \text{ days}}$$

$$(ii) \text{ Receivables Collection Period} = \frac{\text{Receivables } 4,50,000}{\text{Credit sales per day } 1,250} = \underline{360 \text{ days}}$$

$$(iii) \text{ Payable Deferred Period} = \frac{\text{Accounts payable } 1,45,000}{\text{Credit purchase per day } 3,89,000/360} = \frac{1,45,000}{1,055.5} = \underline{137 \text{ days}}$$

Therefore Cash Conversion Cycle = 90 days + 360 days – 137 days = 313 days

Net working capital = Total Current Assets – Total Current Liabilities

= (Inventory + Receivables) – Accounts Payable

= (90,000 + 4,50,000) – 1,45,000

= Tk. 3,95,000

Problem - 2

The Saliford Corporation has an inventory conversion period of 60 days, a receivables collection period of 36 days, and a payables deferred period of 24 days.

- What is the length of the firm's cash conversion cycle?
- If Saliford's annual sales are \$3,960,000 and all sales are on credit, what is the average balance in accounts receivable?
- How many times per year does Saliford turn over its inventory?
- What would happen to Saliford's cash conversion cycle if, on average, inventories could be turned over eight times a year?

Solution

$$a. \left(\begin{array}{c} \text{Cash} \\ \text{conversion} \\ \text{cycle} \end{array} \right) = \left(\begin{array}{c} \text{Inventory} \\ \text{conversion} \\ \text{period} \end{array} \right) + \left(\begin{array}{c} \text{Receivables} \\ \text{collection} \\ \text{period} \end{array} \right) - \left(\begin{array}{c} \text{Payables} \\ \text{deferred} \\ \text{period} \end{array} \right)$$

= 60 days + 36 days – 24 days

= 72 days

$$b. \text{ Average balance in accounts receivables} = \frac{\text{Credit sales } 39,60,000}{\text{Average collection period}/360} = \frac{39,60,000}{36/360}$$

= Tk. 3,96,000

$$\text{c. Inventory Turnover} = \frac{\text{Sales}}{\text{Inventory}} = \frac{39,60,000}{6,60,000} = \underline{\underline{6 \text{ times}}}$$

$$\text{d. Cash conversion cycle} = \frac{360}{8} + 36 - 24 \text{ days} = \underline{\underline{57 \text{ days}}}$$

Review Questions

Short Questions

1. What is working capital investment policy?
2. Discuss the significance of working capital investment policy.
3. What is a cash conversion cycle? Explain.
4. What two key issues does working capital investment policy involve?
5. How would you determine:
 - a) Inventory conversion period, b) Receivables collection period and
 - c) Payable Deferral Period

Broad Questions

6. What is meant by working capital investment policy? Discuss its various forms. Which one is the best and why?

Review Problems

Problem - 1

Peoples Ltd. had projected sales for 2004 Tk. 1,650 million. The projected cost of goods sold was 1,353 million. Assume all sales and purchases are made on credit:

- a) Calculate inventory conversion period as of September 30 and December 31, 2004.
- b) Calculate receivables collection period as on those dates.
- c) Calculate the payables deferral period as on those days.
- d) Calculate cash conversion cycle as on those days.

Problem - 2

Rahim Afrooz is a leading producer of automobile batteries. It turns out 1,500 batteries a day at a cost of Tk. 6 per battery for materials and labor. It takes the firm 22 days to convert raw materials into the battery. It allows its customers 40 days in which to pay for the batteries and the firm generally pays its suppliers in 30 days.

- a) What is the length of cash conversion cycle?
- b) If the firm always produces and sales 1,500 batteries a day, what amount of working capital must it finance?
- c) By what amount would the firm reduce its working capital financing needs if it was able to stretch its payables deferral period to 35 days?

Lesson-3: Working Capital Financing Policy

After successful completion of this lesson 3, you should be able -

- To understand the concept and significance of working capital financing policy;
- To identify the various types of working capital and
- To evaluate the various forms of working capital financing policy.

Concept and Significance of Working Capital Financing Policy

By working capital financing policy we mean that policy which is applied in financing working capital. That is, in financing working capital whether the firm would use : (i) hedging policy; (ii) conservative policy and (iii) moderate policy; is the ultimate theme of the working capital financing policy.

In financing working capital whether the firm would use : (i) hedging policy; (ii) conservative policy and (iii) moderate policy; is the ultimate theme of the working capital financing policy.

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 the management of working capital is how current assets will be financed. There are, broadly speaking two sources from which funds can be raised for current asset financing: (i) short-term sources (current liabilities), and (ii) 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? Decisions on such questions will determine the financing mix.

The sources of financing working capital play a vital role in maintaining liquidity and profitability of the firm. If permanent working capital is financed by short-term loans, the business will face lack of liquid assets when the loan falls due. It will cause interruption in the normal business operation. On the other hand, if temporary working capital is financed by long-term finance, the amount will remain idle after the need for such capital is over; this causes loss to the firm to the extent of cost capital. Therefore, it is also expected that an organization is to select appropriate source for financing the working capital.

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Various Types of Working Capital

Most businesses experience seasonal fluctuations, cyclical fluctuations, or both. For example, construction firms have peaks in the spring and summer, retailer's peak around festivals, and the manufacturers, who supply both construction companies and retailers, follow similar patterns. Similarly, virtually all businesses must build up current assets when the economy is strong, but they then sell off inventories and have net reductions of receivables when the economy slacks off. Still, current assets rarely drop to zero, and this realization has led to the development of the idea that some current assets should be considered **permanent**

The manner in which the permanent and temporary current assets are financed is called the firm's current asset financing policy

current assets because their levels remain stable no matter the seasonal or economic conditions. Temporary current assets are those amounts of current assets that vary with respect to the seasonal or economic conditions of a firm. The manner in which the permanent and temporary current assets are financed is called the firm's current asset financing policy, which generally can be classified as one of the three approaches described next.

Maturity Matching, or "Self-liquidating" Approach: A financing policy that matches asset and liability maturities. This would be considered a moderate current asset financing policy.

Aggressive Approach : A policy where all of the fixed assets of a firm are financed with long-term capital, but some of the firm's permanent current assets are financed with short-term nonspontaneous sources of funds.

Evaluation of Various Financing Policies

There are three basic approaches to determine an appropriate financing mix : (i) Hedging approach, also called the Matching approach; (ii) Conservative approach, and (iii) Trade-off between these two. These are developed and explained with appropriate examples in this section.

The term hedging can be said to refer to a process of a matching maturities of debt with the maturities of financial needs.

(i) Hedging Approach : The term "hedging" is often used in the sense of a risk-reducing investment strategy involving transactions of a simultaneous but opposite nature so that the effect of one is likely to counterbalance the effect of the other. With reference to an appropriate financing mix, the term hedging can be said to refer to a process of a matching maturities of debt with the maturities of financial needs. This approach to the financing decision to determine an appropriate financing-mix is, therefore, also called as matching approach.

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

- (a) Those which are required in a certain amount for a given level of operation and, hence, do not vary over time.
- (b) Those which fluctuate over time

The hedging approach suggests that long-term funds should be used to finance the fixed portion of current assets requirements in a manner similar to the financing of fixed assets; the purely temporary requirements, i.e. the seasonal variations over and above the permanent financing needs should be appropriately financed with short-term funds (current liabilities). This approach, therefore, divides the requirements of total funds into permanent and seasonal components, each being financed by a different source.

According to the hedging approach the permanent portion of funds required should be financed with long-term funds and the seasonal portion with short-term funds. With this approach, the short-term financing requirements (current assets) would be just equal to the short-term financing available (current liabilities). There would, therefore, be no NWC.

(ii) The conservative approach: This approach suggests that the estimated requirement of total funds should be met from long-run sources; the use of short-term funds should be restricted to only emergency situations or when there is an unexpected outflow of funds.

Comparison of Hedging Approach with Conservative Approach

A comparison of the two approaches can be made on the basis of (i) cost considerations and (ii) risk considerations.

(i) Cost Considerations: The cost of these financing plans has a bearing on the profitability of the enterprise. The conservative plan for financing is more expensive because the available funds are not fully utilized during certain periods; moreover, interest has to be paid for funds which are not actually needed i.e. the period when there is NWC).

(ii) Risk Considerations: The two approaches can also be contrasted on the basis of the risk involved. The hedging approach is more risky in comparison to the conservative approach. There are two reasons for this. First, there is, as already observed, no NWC with the hedging approach because no long term funds are used to finance short-term seasonal needs, i.e. current assets are just equal to current liabilities. On the other hand, the conservative approach has a fairly high level of NWC. Secondly, the hedging plan is risky because it involves almost full utilization of the capacity to use short term funds. Hence, in emergency situations it may be difficult to satisfy the short term needs. In contrast, the company need not use any of its short term borrowing capacity with the conservative approach. As a result, the firm has sufficient short term borrowing capacity to cover unexpected financial needs and avoid technical insolvency.

To summarize, the hedging approach is a high profit (low cost) high risk (no NWC) approach to determine an appropriate financing mix. In contrast, the conservative approach is a low profit (high cost) low risk (high NWC). The contrast between these two approaches is indicative of the trade-off between profitability and risk.

Trade-off between the Hedging and Conservative Approaches

It has been shown that the hedging approach is associated with high profits and high risk; while the conservative approach provides low profits and low risk. Obviously, neither approach by itself would serve the purpose of efficient working capital management. As a result, a trade-off between these two extremes would give an acceptable financing strategy. The third approach i.e. trade-off between these two strikes a

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balance and provides a financing plan that lies between these two extremes. It may be, therefore, called a moderate approach.

The exact trade-off between the two approaches will differ from case to case depending on the perception of risk of those who have to take the decision. 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 sources and any other additional funds may be financed through short term sources.

Problems and Solutions

Problem - 1

The Cannon Company is attempting to develop a current asset policy. Its Fixed Assets are \$6,00,000 and the firm plans to maintain a 50% debt-to-asset ratio. The interest rate is 10% on all debts. The three alternative current assets policies under considerations are to carry current assets that total 40%, 50% and 60% of projected sales. The company expects to earn 15% before tax and interest on sales of \$3 million. The firm's marginal tax rate is 40%. Calculate the expected return on equity under each of the alternatives.

Solution

The Cannon Company Alternative Balance Sheets

	Restricted (40%)	Moderate (50%)	Relaxed (60%)
Current assets	\$12,00,000	\$15,00,000	\$18,00,000
Fixed assets	6,00,000	6,00,000	6,00,000
Total Assets	18,00,000	21,00,000	24,00,000
Debt	9,00,000	10,50,000	12,00,000
Equity	9,00,000	10,50,000	12,00,000
Total liabilities and equity	18,00,000	21,00,000	24,00,000

The Cannon Company : Alternative Income Statements

Sales	\$30,00,000	\$30,00,000	\$30,00,000
EBIT	4,50,000	4,50,000	4,50,000
Interest (10%)	(90,000)	(1,05,000)	(1,20,000)
Earnings before taxes (EBT)	3,60,000	3,45,000	3,30,000
Taxes (40%)	(1,44,000)	(1,38,000)	(1,32,000)
Net income	2,16,000	2,07,000	1,98,000
ROE	24%	19.7%	16.5%

Problem - 2

Max Printing Corporation and Azad Publishing House had the following Balance Sheets as of December 31, 2000 (thousands of dollars) :

	Max Printing Corporation	Azad Publishing House
Current assets	\$1,00,000	\$80,000
Fixed assets (net)	<u>1,00,000</u>	<u>1,20,000</u>
Total assets	<u>2,00,000</u>	<u>2,00,000</u>
Current liabilities	20,000	80,000
Long-term debt	80,000	20,000
Common stock	50,000	50,000
Retained earnings	<u>50,000</u>	<u>50,000</u>
Total liabilities and equity	<u>2,00,000</u>	<u>2,00,000</u>

Earning before interest and taxes (EBIT) for both firms are \$30 million, and the marginal tax rate is 40%.

- What is the return on equity for each firm if the interest rate on current liabilities is 10% and the rate on long-term debt is 13% ?
- Assume that the short-term rate rises to 20%. While the rate on new long-term debt rises to 16%, the rate on existing long-term debt remains unchanged. What would be the return on equity for Max Printing Corpn. and Azad Publishing House under these conditions ?
- Which company is in a riskier position ? Why ?

Solution

a. and b.

Income Statements for Year ended December 31, 2000 (Thousands of Dollars)

	Max Printing Corporation		Azad Publishing House	
EBIT	\$30,000	\$30,000	\$30,000	\$30,000
Interest	<u>(12,400)</u>	<u>(14,400)</u>	<u>(10,600)</u>	<u>(18,600)</u>
Taxable income	\$17,600	\$15,600	\$19,400	\$11,400
Taxes (40%)	<u>(7,040)</u>	<u>(6,240)</u>	<u>(7,760)</u>	<u>(4,560)</u>
Net income	<u>\$10,560</u>	<u>\$9,360</u>	<u>\$11,640</u>	<u>\$6,840</u>
Equity	\$1,00,000	\$1,00,000	\$1,00,000	\$1,00,000
Return on Equity	<u>10.56%</u>	<u>9.36%</u>	<u>11.64%</u>	<u>6.84%</u>

The Max Printing Corp. has a higher ROE when short-term interest rates are high, whereas Azad Publishing House does better when rates are lower.

c. Azad's position is riskier. First, its profit and return on equity are much more volatile than Max's. Second, Azad must renew its large short-term loan every year, and if the renewal comes up at a time when money is very tight, when its business is depressed, or both, then Azad could be denied credit, which could put it out of business.

Review Questions

A. Short Questions

1. Define working capital financing policy and examine its significance.
2. Distinguish between : (a) Permanent working capital and Temporary working capital
3. Explain the risk return trade-off working capital financing.

B. Broad Questions

4. Discuss the various types of current assets in the context of financing.
5. Explain the various elements of working capital financing. Which one is the best and why ?

Review Problems

Problem -1

Janata Firm has an investment of Tk. \$500 million in total assets of which 60% I fixed assets and 40% in current assets. It is expected that the investment will earn a return of 18% before interest and taxes. Tax rate is 35%. The firm maintains a debt ratio of 60%. The firm has to decide whether it should use a 12% short-term debt or a 14% long-term debt to finance its current assets. The financing plans would affect the return on equity fund. Calculate return on equity under different financing plans.

Problem - 2

The Sunshine Corporation is attempting to determine the optimum level of current assets for the coming year. Management expects sales to increase to \$2 million as a result of an asset expansion undertaken. Fixed assets total \$1 million and the firm finances 60% of its total assets with debt and the rest with equity. The firm's interest cost currently is 8% on both the short-term and long-term debts. Three alternatives regarding the projected current assets level are (i) a tight policy requiring current assets of only 45% of projected sales, (ii) a moderate policy of 50% of sales and (iii) relaxed policy of 60% of sales. The firm expects to generate EBIT at a rate of 12% on total assets.

- a. What is the expected return on equity under each current asset level, assuming 40% tax rate.

Case Study

Three companies namely Aggressive Between and Defensive have different working capital management policies as indicated by their names. Aggressive employs only minimal current assets and finances almost entirely with current liabilities and equity. These light shit approach has a duel effect. It keeps total assets lower which would tend to increase return on assets. But for reasons such as stock-outs total assets are reduced but variable cost is increased because of more frequent

order of similar quantities of raw materials. The balance sheets for the three companies as of 31-12-2004 are presented below :

	Aggressive (Tk.)	Between (Tk.)	Defensive (Tk.)
Fixed assets	2,00,000	2,00,000	2,00,000
Current assets	1,50,000	2,00,000	3,00,000
Total assets	3,50,000	4,00,000	5,00,000
Share capital and reserves	1,50,000	2,00,000	2,50,000
Long-tern debt (10%)	-	1,00,000	2,00,000
Current liabilities (8%)	2,00,000	1,00,000	50,000
Total claims	3,50,000	4,00,000	5,00,000
Current ratio	0.75 x	2 x	6 x

The cost of goods sold functions for the firms are as follows :

Cost of goods sold = Fixed costs + Variable costs

Aggressive = Tk. 2,00,000 + 70% of sales

Between = Tk. 2,50,000 + 60% of sales

Defensive = Tk. 3,00,000 + 60% of sales

A Company with normal net working capital such as Between will sell Tk. 10,00,000 in a year when economic growth is average. If the company is weak sales for Between will be reduced by Tk. 1,00,000; if strong, sales for Between will increase by Tk. 1,00,000. In any given economic conditions, Aggressive will sell Tk. 1,00,000 less than Between, and Defensive will sell Tk. 1,00,000 more. This is because of working capital differences.

Questions

- Complete the income statement that follow for strong, average and weak economies.
- Compare the rates of return (EBIT/Assets) and return on equity. Which company is the best in a strong economy ? In an average economy ? In a weak economy ?
- What are the considerations for management of working capital that are indicated by this problem ?

Lesson-4: Working Capital Planning

After successful completion of the lesson 4, you should be able -

- To assess the importance for working capital for your firm;
- To identify the differences between permanent, temporary and balanced working capital;
- To identify the determinants of working capital requirements;
- To know about the techniques of working capital planning and
- To grasp the methods of estimating working capital requirements.

Importance of Working Capital

The need for working capital arises because of its significance in corporate firms. Working capital is needed because credit sales are not converted into cash instantaneously. There is always an operating cycle involved in the conversion of credit sales into cash.

Operating Cycle

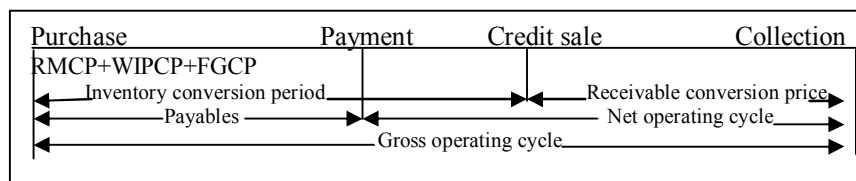
Operating cycle is the time duration required to convert credit sales into cash after the conversion of resources into inventories. The operating cycle of a manufacturing firm involves three phases which are as follows:

- (i) **Acquisition of resources** such as raw materials, supplies, labors and other costs of production.
- (ii) **Manufacture of the product, which** includes conversion of raw materials into working progress into finished goods.
- (iii) **Sale of the product** either for cash or on credit. Credit sales create accounts receivables for collection.

These phases affect cash flows, which most of the time, are neither synchronized nor certain. Therefore, the firm is required to invest in current assets for smooth and uninterrupted functioning. The following Figure 1 shows the operating cycle of a manufacturing firm.

Operating cycle is the time duration required to convert credit sales into cash after the conversion of resources into inventories.

Figure --: Operating Cycle of a Manufacturing Firm



Permanent, Temporary and Balanced Working Capital

This permanent requirement is referred to as permanent or fixed working capital.

The operating cycle, thus, creates the need for current assets (working capital). However, the need does not come to an end after the cycle is completed. It will continue to exist. To explain this continuing need of current assets, a distinction should be drawn between permanent and temporary working capital.

The need for current assets arises, as already observed, because of the cash cycle. Business activity does not come to an end after the realization of cash from customers. For a company, the process is continuous and, hence, the need for a regular supply of working capital. However, the magnitude of working capital required will not be constant, but, will fluctuate. To carry on business a certain minimum level of working capital is necessary on a continuous and uninterrupted basis. For all practical purposes, this requirement will have to be met permanently as with other fixed assets. This permanent requirement is referred to as *permanent or fixed working capital*.

Any amount over and above the permanent level of working capital is temporary, fluctuating or variable working capital. This portion of the required working capital is needed to meet fluctuations in demand consequent upon changes in production and sales as a result of seasonal changes. The basic distinction of between permanent and temporary working capital is illustrated in Figure 2.

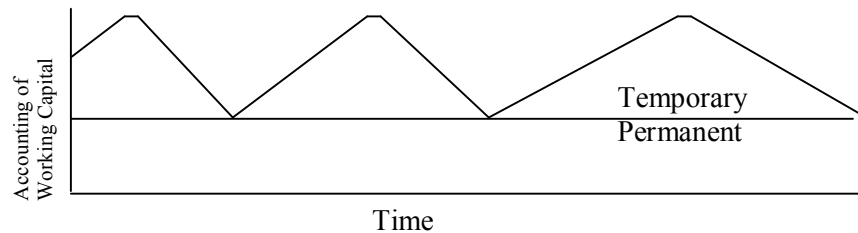


Figure : Permanent and Temporary Working Capital

Figure 2 shows that the permanent level is fairly constant, while temporary working capital is fluctuating – sometimes increasing and sometimes decreasing in accordance with seasonal demands. In the case of an expanding firm the permanent working capital line may not be horizontal. This is because the demand for permanent current assets might be increasing (or decreasing) to support a rising level of activity. In that case the line would be rising one as shown in Figure 3.

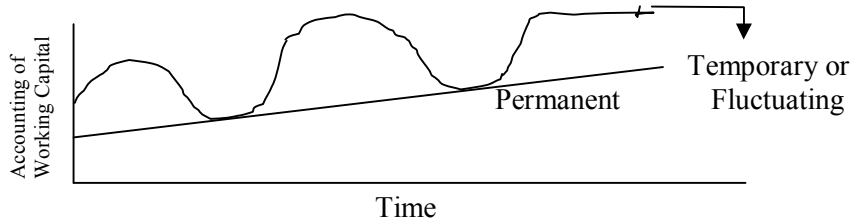


Figure : Permanent and Temporary Working Capital

Both kinds of working capital are necessary to facilitate the sales process through the operating cycle. Temporary working capital is created to meet liquidity requirements that are of a purely transient nature.

Temporary working capital is created to meet liquidity requirements that are of a purely transient nature.

Changes in Working Capital : The changes in the level of working capital occur for the following three basic reasons : (i) changes in the level of sales and/or operating expenses, (ii) policy changes and (iii) changes in technology.

Balanced Working Capital Position:

A corporate firm should maintain a balanced working capital position, which means not excess of working capital nor shortage of working capital. Both excessive as well as shortage of working capital positions are dangerous for the firm. Excessive working capital means idle funds which earns no profit for the firms. Shortage of working capital not only impairs the firm's profitability but also results in production interruptions and inefficiencies.

A corporate firm should maintain a balanced working capital position, which means not excess of working capital nor shortage of working capital.

The dangers of excessive working capital are as follows:

- (i) Unnecessary accumulation of inventories;
- (ii) Defective credit policy and slack collection period;
- (iii) Managerial inefficiency and
- (iv) Growing speculative profits.

Inadequate working capital has the following dangers:

- (i) Stagnating growth;
- (ii) Difficulty to implement operating plans and to achieve the profit target;
- (iii) Creeping operating inefficiencies;
- (iv) Under-utilization of fixed assets;
- (v) Failure to avail attractive credit opportunities and
- (vi) Tightening credit terms.

An efficient financial management should therefore, maintain the proper amount of working capital on a continuous basis.

Determinants of Working Capital Requirements

The importance of efficient working capital management, as an aspect of over-all financial management, has been highlighted in the preceding sections. A firm should plan its operations in such a way that it should have neither too much nor too little working capital. The total working capital requirement is determined by a wide variety of factors. It should be however, noted that these factors affect different enterprises differently. They also vary from time to time. In general, the following factors are involved in a proper assessment of the quantum of working capital required.

General Nature of Business

The total working capital requirement is determined by a wide variety of factors.

The working capital requirements of an enterprise are basically related to the conduct of the business. Enterprises fall into some broad categories depending on the nature of their business. For instance, public utilities have certain features which have a bearing on their working capital needs. At the other extreme are trading and financial enterprises. The manufacturing enterprises fall, in a sense, between these two extremes.

Production Cycle

Another factor which has a bearing on the quantum of working capital is the production cycle. The term “production” or “manufacturing cycle” refers to the time involved in the manufacture of goods. It covers the time-span between the procurement of raw materials and the completion of the manufacturing process leading to production of finished goods. Funds will have to be necessarily tied-up during the process of manufacture, necessitating enhanced working capital. In other words, there is some gap before raw materials become finished goods. To sustain such activities the need for working capital is obvious. The longer the time-span (i.e. the production cycle), the larger the working capital needed and vice-versa.

Business Cycle

The working capital requirements are also determined by the nature of the business cycle. Business fluctuations lead to cyclic and seasonal changes which, in turn, cause a shift in the working capital position, particularly for temporary working capital requirements. The variations in business conditions may be in two directions : (i) upward phase when boom conditions prevail and (ii) downswing phase when economic activity is marked by decline.

Production Policy

The quantum of working capital is also determined by production policy. In the case of certain lines of business, the demand for products is seasonal, i.e., they will be purchased during certain months of the year. What kind of production policy should be followed in such cases ? There

are two options open to such enterprises : either they confine their production only to periods when goods are purchased or they follow a steady production policy throughout the year and produce goods at a level to meet the peak demand. In the former case, there will be serious production problems. During the slack season the firm will have to maintain its working force and physical facilities without adequate production and sale.

Credit Policy

The level of working capital is also determined by credit policy which relates to sales and purchases. The credit policy influences the requirement of working capital in two ways : (i) through credit terms granted by the firms to its customers/ buyers of goods; (ii) credit terms available to the firm from its creditors.

Growth and Expansion

As a company grows, it is logical to expect that a larger amount of working capital will be required. It is, of course, difficult to determine precisely the relation between the growth in the volume of business of a company and the increase in its working capital in a going company also shifts with economic circumstances and corporate practices. Other things being equal, growth industries require more working capital than those that are static.

Vagaries in the Availability of Raw Materials

The availability or otherwise of certain raw materials on a continuous basis without interruption would sometimes affect the requirement of working capital. There may be some materials which cannot be procured easily either because their sources are few or they are irregular. To sustain smooth production, therefore, the firm might be compelled to purchase and stock them far in excess of genuine production needs. This will result in an excessive inventory of such materials.

Profit Level

The level of profits earned differ from enterprise to enterprise. In general, the nature of the product, hold on the market, quality of management, and monopoly power would by and large determine the profit earned by a firm. The net profit is a source of working capital to the extent that it has been earned in cash. The cash profit can be found by adjusting non- cash items such as depreciation, outstanding expenses and losses written off, in the net profit. But, in practice, the net cash inflows from operations can not be considered as cash available for use at the end of the cash cycle.

The net profit is a source of working capital to the extent that it has been earned in cash.

The availability of internal funds for working capital requirements is determined not merely by the profit margin but also on the manner of appropriating profits. The availability of such funds would depend upon the profit appropriations for taxation, dividend, reserves and depreciations.

Level of Taxes

The first appropriation out of profits is payment or provision for tax. The amount of taxes to be paid is determined by the prevailing tax regulations. The management has no discretion in this respect. Very often taxes have to be paid in advance on the basis of the profit of the preceding year. Tax liability is, in a sense, short-term liability payable in cash. An adequate provision for tax payments is, therefore, an important aspect of working capital planning. If tax liability increases, it will lead to an increase in the requirement of working capital and vice - versa.

Dividend Policy

Another appropriation of profits which has a bearing on working capital is dividend payment. The payment of dividend consumes cash resources and, thereby, affects working capital to that extent. Conversely, if the firm does not pay dividend but retains the profit, working capital will increase. In planning working capital requirements, therefore, a basic question to be decided is whether profits will be retained or paid out to shareholders. In theory, a firm should retain profits to preserve cash resources and, at the same time, it must pay dividends to satisfy the expectations of investors. When profits are relatively small, the choice is between retention and payment. The choice must be made after taking account of all the relevant factors.

Depreciation Policy

Depreciation policy also exerts an influence on the quantum of working capital. Depreciation charges do not involve any cash outflow. The effect of depreciation policy on working capital is, therefore, indirect. In the first place, depreciation affects the tax liability and retention of profits. Depreciation is allowable expenditure in calculating net profits. Enhanced rates of depreciation will lower the profits and, therefore, the tax liability and, thus, more cash profits. Higher depreciation will also mean lower disposable profits and, therefore, a smaller dividend payment.

Price Level Changes

Changes in the price level also affect the requirements of working capital. Rising prices would necessitate the use of more funds for maintaining an existing level of activity. For the same level of current assets, higher cash outlays will be required. The effect of rising prices will be that a higher amount of working capital will be needed.

Operating Efficiency

The operating efficiency of management is also an important determinant of the level of working capital. Management can contribute to a sound working capital position through operating efficiency. Although management cannot control the rise in prices, it can ensure the efficient utilization of resources by eliminating waste, improving coordination, and fuller utilization of existing resources, etc. Efficiency of operations

accelerates the pace of the cash cycles and improves the working capital turnover. It releases the pressure on working capital by improving profitability and the internal generation of funds.

Techniques of Working Capital Planning

The important techniques that can be successfully used in working capital planning are : (i) projected funds flow statements; (ii) budget statements and (iii) proforma statements. The fund flow statement is made up of two parts viz., statement of movements of funds showing the sources and application of funds and a schedule of changes in working capital. Cash budget and revenue budget serve as a planning tool for working capital. The revenue budget is mainly composed of (i) sales budget; (ii) material budget, (iii) production budget; (iv) purchase budget; (v) working capital budget and the like. The cash budget is composed of cash inflows and cash outflows. The proforma statements are composed of proforma profit and loss statement and proforma balance sheet. All these cash budget, proforma profit and loss account, proforma balance sheet and fund flow statement have already been discussed in earlier lesson.

The important techniques that can be successfully used in working capital planning are : (i) projected funds flow statements; (ii) budget statements and (iii) proforma statements.

Methods of Estimating Working Capital Requirements

The most appropriate method of estimating the working capital needs of a firm is the concept of operating cycle discussed earlier. However, some other methods may be used to determine the working capital needs. These are discussed as follows :

- (i) **Current assets holding period** : To estimate working capital requirement on the basis of average holding period of current assets and relating them to cost based on firm's experience in the previous years. This method is essentially based on the operating cycle concept.
- (ii) **Ratio of sales** : To estimate working capital requirements as a ratio of sales on the assumption that current assets change with sales.
- (iii) **Ratio of fixed investment** : In this case working capital requirements are estimated as a percentage of fixed investment.

The most appropriate method of estimating the working capital needs of a firm is the concept of operating cycle

A number of factors will govern the selection of the methods of estimating working capital. Factors such as seasonal variations in operations, accuracy of sales forecast, investment costs and variability in sales price would generally be considered. The production cycle and the production and collection policies would also have an impact on working capital requirements. Therefore, these should be given due weightage in projecting working capital requirements.

Problems and Solutions

Problem - 1

Bata Company is interested to purchase a business and has consulted you, as a financial analyst to advise them as regards the average amount of working capital required in the first year. You are given the following

estimates and are advised to add 10% to your figure to allow for contingencies.

Estimates	Amount (Tk.)
Average amount backed up for finished products	5,000
Average amount backed up for materials etc.	8,000
Average credit given :	
Local sales - 6 weeks credits	3,12,000
Export sales- 1.5 weeks credit	78,000
Average time lag in payment of :	
Wages- 1.5 weeks	2,60,000
Stocks, materials etc.- 1.5 months	48,000
Rent, Royalties etc.- 6 months	10,000
Clerical staff- 0.5 month	62,400
Manager – 0.5 month	4,800
Other expenses- 1.5 months	48,000
Payment in advance :	
Sundry expenses- paid quarterly	8,000
Undrawn profits	11,000

Solution

Statement to determine Net Working Capital for Bata Company

(A) Current assets :	Amount (Tk.)
(i) Stock of finished product	5,000
(ii) Stock stores, materials, etc.	8,000
(iii) Debtors :	
Inland sales 6 weeks	
Credit sales	
= -----	
Debtors turnover	
Tk. 3,12,000 x 6	
= -----	
52	36,000
Export sales 1.5 weeks	
Tk. 78,000 x 3	
= -----	
104	2,250
(iv) Advance payment of sundry expenses :	
Tk. 8,000 x 1	
= -----	
4	2,000
Total investment in current assets	<u>53,250</u>

(B) Current liabilities :

(i) Wages $\left(\frac{Tk.2,60,000}{104}\right)$	7,500
(ii) Stocks, materials etc. $\left(\frac{Tk.48,000 \times 3}{24}\right)$	6,000
(iii) Rent, royalties, etc. $\left(\frac{Tk.10,000 \times 6}{12}\right)$	5,000
(iv) Clerical staff $\left(\frac{Tk.62,400 \times 1}{24}\right)$	2,600
(v) Manager $\left(\frac{Tk.4,800 \times 1}{24}\right)$	200
(vi) Miscellaneous expenses $\left(\frac{Tk.48,000 \times 3}{24}\right)$	6,000
Total estimate of current liabilities	27,300

(C) Net working capital :

(i) Current assets – Current liabilities (A - B)	25,950
(ii) Add 10% contingency allowance	<u>2,595</u>
Average amount of working capital required	28,545

Assumptions :

- (i) For calculations a time period of 52 weeks/12 months has been assumed in a year.
- (ii) Undrawn profit has been ignored in the working capital computation for the following reasons:
 - (a) For the purpose of determining working capital provided by net profit, it is necessary to adjust the net profit for income tax and dividends/ drawing, etc.
 - (b) 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, etc.
- (iii) Actual working capital requirement would be more than what is estimated here as in the question cash component of current assets is not given.

Problem - 2

While preparing a project report on behalf of a client you have collected the following facts. Estimate the net working capital required for that project. Add 10% to your computed figure to allow contingencies.

	Amount per unit (Tk.)
Estimated cost per unit of production is :	
Raw materials	80
Direct labor	30
Overheads (exclusive of depreciation)	<u>60</u>
Total cost	<u>170</u>
Additional information :	
Selling price	Tk. 200 per unit
Level of activity	1,04,000 units of production per annum
Raw materials in stock	average 4 weeks
Work in progress (assume 50% completion stage in respect of conversion costs)	average 2 weeks
Finished goods in stock	average 4 weeks
Credit allowed by suppliers	average 4 weeks
Credit allowed to debtors	average 8 weeks
Lag in payment of wages	average 1.5 weeks
Cash at bank is expected to be	Tk. 25,000

You may assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only.

Solution

	Amount (Tk.)
(A) Current assets :	
(i) Raw materials in stock, average 4 weeks :	
$\left(\frac{Tk. 1,04,000 \times Tk. 80 \times 4}{52} \right)$	6,40,000
(ii) Work in progress, average 2 weeks :	
(a) Raw material $\left(\frac{Tk. 1,04,000 \times Tk. 80 \times 2}{52} \right)$	3,20,000
(b) Direct labor $\left(\frac{Tk. 1,04,000 \times Tk. 15 \times 2}{52} \right)$	60,000
(c) Overheads $\left(\frac{Tk. 1,04,000 \times Tk. 30 \times 2}{52} \right)$	1,20,000
(iii) Finished goods stock, average 4 weeks :	
$\left(\frac{Tk. 1,04,000 \times Tk. 170 \times 4}{52} \right)$	13,60,000
(iv) Debtors, average 8 weeks :	
$\left(\frac{Tk. 1,04,000 \times Tk. 170 \times 8}{52} \right)$	27,20,000
(v) Cash at bank	<u>25,000</u>
Total investment in current assets	<u>52,45,000</u>
(B) Current liabilities :	
(i) Creditors, average 4 weeks $\left(\frac{Tk. 1,04,000 \times Tk. 80 \times 4}{52} \right)$	6,40,000
(ii) Lag in payment of wages, average 1.5 weeks : $\left(\frac{Tk. 1,04,000 \times Tk. 30 \times 3}{104} \right)$	<u>90,000</u>
Total current liabilities	<u>7,30,000</u>
(C) Net working capital :	
Current assets – Current liabilities = Tk. 52,45,000 – Tk. 7,30,000	45,15,000
Add 10% contingencies	<u>4,51,500</u>
	49,66,500

Assumptions: A full unit of raw material is required at the beginning of the manufacturing process and, therefore, total cost of the material, i.e., Tk. 80 per unit has been taken into consideration, while in the case of expenses, viz., direct labor and overheads, the unit has been finished only to the extent of 50%. Accordingly, Tk. 15 and Tk. 30 have been charged for direct labor and overheads respectively.

Review Questions

A. Short Questions

1. How would you assess the need for working capital of a corporate firm?
2. “Length of operating cycle is the main determinant of working capital needs of a firm”. Explain.
3. Distinguish between operating cycle and production cycle of a manufacturing firm.
4. What are the three phases of operating cycle ? Discuss.
5. Distinguish between permanent and temporary working capital.
6. What do you mean by balanced working capital ?
7. What are the dangers of excessive working capital ?
8. What are the adverse impacts of shortage of working capital ?
9. What are the major techniques of working capital planning ? Explain.
10. How would you estimate working capital needs of a firm ?

B. Broad Questions

11. Describe the various factors which affect the working capital requirement of a manufacturing firm.

Review Problems

Problem - 1

A proforma cost sheet of a company provides the following data :

	Tk.
Cost (per unit) :	
Raw materials	52.0
Direct labor	19.50
Overheads	39.0
Total cost (per unit)	110.50
Profit	19.50
Selling price	130.0

The following is the additional information available :

Average raw materials in stock : one month; average materials in process : half month. Credit allowed by suppliers : one month; credit allowed to debtors : two months. Time lag in payment of wages : One and half a weeks. Overheads : one month. One-fourth sales are on cash basis. Cash balance is expected to be Tk. 1,20,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 70,000 units of output. You may assume that production is carried on evenly throughout the year and wages and overheads accrue similarly.

Problem - 2

While preparing a project report on behalf of client you have collected the following facts. Estimate the net working capital required for that project. Add 10% to your computed figure to allow for contingencies.

	Amount per unit (Tk.)
Estimated cost per unit of production is:	
Raw material	42.4
Direct labor	15.9
Overheads (exclusive of depreciation)	31.8
Total cost	<u>90.1</u>
	Amount per unit (Tk.)
Additional information :	
Selling price	<u>Tk. 106</u>
Level of activity	1,00,000units of production annually
Raw material in stock	Average 4 weeks
Work in progress (50% completion)	Average 2 weeks
Finished goods in stock	Average 4 weeks
Credit allowed by suppliers	Average 4 weeks
Credit allowed to debtors	Average 8 weeks
Lag in payment of wages	Average 1.5 weeks
Cash at bank (expected)	1,25,000

Assume that all sales are on credit

Lesson-5: Cash Management

After successful completion of the lesson 5, you should be able -

- To understand the meaning, objectives and significance of cash management;
- To identify the motives for holding cash;
- To grasp the methods of determining cash requirements for a firm;
- To explain the basic strategies of cash management and
- To acquire the techniques/processes involved in cash management.

Meaning, Objectives and Significance of Cash Management

A major function of the financial manager is to maintain a sound cash position.

Cash is the important current asset for the operations of the business. Cash is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.

The basic objectives of cash management are two-fold namely : (a) to meet the cash disbursements needs (payment schedule) and (b) to minimize funds committed to cash balances. These are conflicting and mutually contradictory and the task of cash management is to reconcile them.

(a) Meeting the 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, staffs and employees and the like. 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. A basic objective of cash management is therefore, to meet the payment schedule.

(b) Minimizing Funds Committed to Cash Balances

While minimizing cash balances two conflicting aspects have to be reconciled. A high level of cash balances will ensure prompt payment. But, it would lead to large funds remaining idle, as cash is a non-earning asset. On the contrary, a low level cash balances may mean failure to meet the payment schedule. The aim of cash management therefore, should be to have an optimal amount of cash balance.

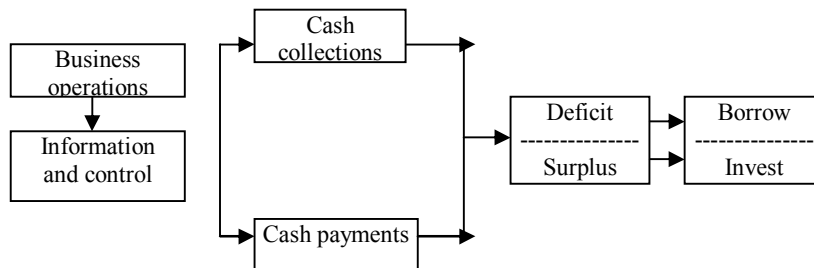
One of the tasks of financial management is to manage cash effectively and efficiently. Because, poor cash management may have serious

consequences. It is possible for a company to go bankrupt or to be taken over even it does well; since rapid increase in sales will involve heavy expenses on stocks and the extension of credits, thereby depleting cash resources. Alternatively, if idle cash reserves are built up, this suggests that investment opportunities are being missed and the business may be stagnating. Therefore, finding reasonable amount of funds for operating needs is a perennial pre-occupation for the firm's finance manager. Paucity of cash, even on a temporary phase, is a source of trouble to most enterprises. Nor, it is wise to have excess cash which is not a productive asset. Now, the question arises as to the reasonable amount of cash to be maintained by an enterprise. No standard answer can be provided for this question. Past trends, industry averages and inter-firm comparison can provide some useful indications in this regard. However, one author of financial management opines that management should project the future cash receipts and cash payments of the firm with various cash balances, deduct the payments from the receipts to determine the net cash flows and then select that cash balance which maximizes the present value of the net cash flows.

Cash management is concerned with the managing of : (i) cash flows into and out of the firm, (ii) cash flows within the firm, and (iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash. It can be represented by a cash management cycle as shown in Figure-31.1. Sales generate cash which has to be disbursed out. The surplus cash has to be invested while deficit has to be borrowed. Cash management seeks to accomplish this cycle at a minimum cost. At the same time, it also seeks to achieve liquidity and control. Cash management assumes more importance than other current assets because cash is the most significant and the least productive asset that a firm holds. It is significant because it is used to pay the firm's obligations. However, cash is unproductive. Unlike fixed assets or inventories, it does not produce goods for sale. Therefore, the aim of cash management is to maintain adequate control over cash position to keep the firm sufficiently liquid and use excess cash in some profitable way.

The aim of cash management is to maintain adequate control over cash position to keep the firm sufficiently liquid and use excess cash in some profitable way.

Figure – Cash Management Cycle



The management of cash is also important because it is difficult to predict cash flows accurately, particularly the inflows, and there is no perfect coincidence between the inflows and outflows of cash. During some periods, cash outflows will exceed cash inflows, because payments for taxes, dividends, or seasonal inventory may build up. At other times,

cash inflow will be more than cash payments because there may be large cash sales and debtors may be realized in large sums promptly. Cash management is also important because cash constitutes the smallest portion of the total current assets, yet management's considerable time is devoted in managing it. In recent past, a number of innovations have been done in cash management techniques. An obvious aim of the firm now-a days is to manage its cash affairs in such a way as to keep cash balance at a minimum level and to invest the surplus cash in profitable investment opportunities.

The ideal cash management system will depend on the firm's products, organization structure, competition, culture and options available.

The ideal cash management system will depend on the firm's products, organization structure, competition, culture and options available. The task is complex, and decisions taken can affect important areas of the firm. For example, to improve collections if the credit period is reduced, it may affect sales. However, in certain cases, even without fundamental changes, it is possible to significantly reduce cost of cash management system by choosing a right bank and controlling the collections properly.

Motives for Holding Cash

There are four primary motives for holding cash which are discussed below :

(i) Transaction Motive : A very important reason for maintaining cash balance is the transaction motive. The requirement of cash balances to meet routine cash needs is known as the transaction motive and such cash balances are called transaction balances. Thus, transaction motive refers to the holding of cash to meet anticipated obligations whose timing is not perfectly synchronized with cash receipts.

(ii) Precautionary Motive : A firm may have to pay cash for the purposes which cannot be predicted or anticipated. The unexpected cash needs at a short notice may arise due to : (a) any natural calamities and strikes and lockouts; (b) failure of important customers; (iii) unexpected slow down in collection of debtors; (iv) cancellation of some orders for goods; (v) sharp increase in cost of raw materials etc. The cash balances held in reserve for such random and unforeseen fluctuations in cash flows are called precautionary balances. Hence, precautionary motive implies the need to hold the cash to meet unpredictable obligations.

(iii) Speculative Motive : It refers to the desire of a firm to take advantage of opportunities which present themselves at unexpected moments and which are typically outside the normal course of business. Such motive represents a positive and aggressive approach. Firms aim to exploit profitable opportunities keep cash in reserve to do so.

(iv) Compensation Motive : Customers of a bank are usually required to maintain a minimum cash balance at that bank for providing services to them. Since this balance cannot be utilized by the firms for transaction purposes, the banks themselves can use the amount to earn a return. Such balances are known as compensating balances. These balances are also required by some loan agreements between a bank and its customers.

Methods of Determining Cash Requirements

The factors that determine the required cash balances are :

Synchronization of Cash Flows

The need for maintaining cash balances arises from the non-synchronization 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 balances. The first consideration in determining the cash need is, therefore, the extent of non- synchronization of cash receipts and disbursements. For this purpose, the inflows and outflows have to be forecasted over a period of time.

Short Fall Costs

Another general factor to be considered in determining cash needs is the cost associated with a shortfall in the firm's cash needs. The cash forecast presented in the cash budget would reveal periods of cash shortages. In addition, there may be some unexpected shortfalls. Every shortage of cash – whether expected or unexpected – involves 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 costs”. Included in the short costs are :

- (i) *Transaction costs* 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.
- (ii) *Borrowing Costs* associated with borrowing to cover the shortage. These include items such as interest on loan, commitment charges and other expenses relating to the loan.
- (iii) Loss of trade-discount, i.e. a substantial loss because of a temporary shortage of cash.
- (iv) Cost associated with deterioration of the firm's credit rating which is reflected in higher bank charges on loans, stoppage of supplies, demands for cash payment, refusal to sell, loss of firm's image and the attendant decline in sales and profits.
- (v) Penalty rates by banks to meet a shortfall in compensating balances.

Excess Cash Balance Costs

Another consideration in determining cash needs is the cost associated with maintaining excess/idle cash. The cost of having excessively large cash balances is known as 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.

Procurement and Management

These are the costs 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.

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.

Determining Cash Need – Cash Budget

After the examination of the pertinent considerations and cost that determine cash needs, the next questions deals with the determination of a firm's cash needs.

There are two approaches to derive an optional cash balance, namely, (a) Minimizing Cost Model and (b) Cash Budget.

Cash Budget : Cash Management Tool

A firm is well-advised to hold adequate cash balances but should avoid excessive balances. The firm has, therefore, to assess its need for cash properly. The cash budget is probably the most important tool in cash management. It is a device to help a firm to plan and control the use of cash. It is a statement showing the estimated cash income (cash inflow) and cash expenditure (cash outflow) over the firm's planning horizon. In other words, the net cash position (surplus or deficiency) of a firm as it moves from one budgeting sub-period to another is highlighted by the cash budget.

One of the primary responsibilities of the financial manager is to maintain a sound liquidity position of the firm so that the dues are settled in time. The firm needs cash to purchase raw materials and pay wages and other expenses as well as for paying dividend, interest and taxes. The test of liquidity is the availability of cash to meet the firm's obligations when they become due.

A firm maintains the operating cash balance for transaction purposes. It may also carry additional cash as a buffer or safety stock. The amount of cash balance will depend on the risk-return trade-off. If the firm maintains small cash balance, its liquidity position weakens, but its profitability improves as the released funds can be invested in profitable opportunities (marketable securities. When the firm needs cash, it can sell its marketable securities (or borrow). On the other hand, if the firm keeps a high cash balance, it will have a strong liquidity position but its profitability will be low. The potential profit foregone on holding large cash balance is an opportunity cost of the firm. The firm should maintain optimum – just enough, neither too much nor too little – cash balance.

How to determine the optimum cash balance if cash flows are predictable and if they are not predictable ?

Optimum Cash Balance under Certainty : Baumol's Model

The Baumol's cash management model provides a formal approach for determining firm's optimum cash balance under certainty. It considers cash management similar to an inventory management problem . As such, the firm attempts to minimize the sum of the cost of holding cash (inventory of cash) and the cost of converting marketable securities to cash.

The Baumol's model makes the following assumptions :

- The firm is able to forecast its cash needs with certainty.
- The firm's cash payments occur uniformly over a period of time.
- The opportunity cost of holding cash is known as and it does not change over time.
- The firm will incur the same transaction cost whenever it converts securities to cash.

Basic Strategies of Cash Management

In order to resolve the uncertainty about cash flow prediction and lack of synchronization between cash receipts and payments, the firm should develop appropriate strategies for cash management. The firm should evolve strategies regarding the following four facets of cash management:

- **Cash planning** Cash inflows and outflows should be planned to project cash surplus or deficit for each period of the planning period.. Cash budget should be prepared for this purpose.
- **Managing the cash flows** The flow of cash should be properly managed. The cash inflows should be accelerated while, as far as possible, the cash outflows should be decelerated.
- **Optimum cash level** The firm should decide about the appropriate level of cash balances. The cost of excess cash and danger of cash deficiency should be matched to determine the optimum level of cash balances.
- **Investing surplus cash** The surplus cash balances should be properly invested to earn profits.

Cash Management : Basic Strategies

The cash budget, as a cash management tool, would throw light on the net cash position of a firm. After knowing the cash position, the management should work out the basic strategies to be employed to manage its cash. The present section attempts to outline the basic strategies of cash management.

It may be noted at the outset that the broad cash management strategies are essentially related to the cash turn-over process, i.e., the cash cycle

together with the cash turn-over. The cash cycle refers to the process by which cash is used to purchase materials from which are produced goods, which are then sold to customers, who later pay bills. The firm receives cash from customers and the cycle repeats itself. The cash turn-over means the number of times firm's cash is used during each year.

Minimum Operating Cash

The higher the cash turn-over, the less cash the firm requires. The firm should, therefore, try to maximize the cash turn-over. But it must maintain a minimum amount of operating cash balance so that it does not run out of cash.

The cash management strategies are intended to minimize the operating cash balance requirement. The basic strategies that can be employed to do the needful are-

- (i) Stretching accounts payable,
- (ii) Efficient inventory – production management,
- (iii) Speedy collection of accounts receivables and
- (iv) Combined cash management strategy.

Each of the above strategies are discussed below briefly :

(i) Stretching accounts payable

One of the basic strategies of efficient cash management is to stretch the accounts payable. This means that a firm should make delay as far as possible in paying its accounts payable without its credit standing. It should however take advantage of the cash discount available on prompt payment.

(ii) Efficient inventory – production management

Another important strategy is to increase the inventory turnover rate avoiding stock-outs. This can be done as follows :

- (a) Increasing raw materials turn-over
- (b) Decreasing production cycle
- (c) Increasing finished goods turn-over

(iii) Speedy collection of accounts receivables

Another strategy for efficient cash management is to collect accounts receivables as quickly as possible without losing future sales. The average collection period can be reduced by bringing changes in credit terms, credit standards and collection policies.

(iv) Combined cash management strategy

In this strategy all the above mentioned strategies are combined together in order to bring efficiency of the cash management. These three strategies may lead to a reduction in the cash balance.

Techniques and Processes of Cash Management

The main techniques of cash management are discussed below :

- (i) **Speedy cash collection** : In managing cash efficiently, the inflow process can be accelerated by encouraging the customers to pay as quickly as possible and converting the payment from the customers into cash without any delay. Speedy cash collection may also be ensured by decentralizing collection of accounts receivables.
- (ii) **Slowing disbursement** : The operating cash requirement can be reduced by slowing disbursements of accounts payable. This can be done as follows : avoidance of early payments, centralized disbursements, creating floats and creating accruals.

Review Questions

Short Questions

1. What is cash management ?
2. What are the objectives of cash management ?
3. What are the adverse consequences of poor cash management ?
4. What are the goals of cash management strategies ?
5. Examine the significance of speedy receivables collection.
6. What is the significance of slow payments of accounts payable ?
7. Explain the deposit float and payment float ?

Broad Questions

8. Examine the significance of cash management.
9. What are the factors that influence cash requirements of a firm.? Explain.
10. What are the models that can be used in determining the cash needs of a firm ? Discuss.
11. Describe the basic strategies of efficient cash management.
12. Narrate the processes of efficient cash management

Lesson-6: Inventory Management Principles

After successful completion of the lesson 6, you should be able -

- To understand the concepts and significance of inventory and inventory management;
- To realize the objectives of inventory management and
- To realize the benefits of holding optimum level of inventory.

Concepts and Significance of Inventory and Inventory Management

The term 'inventory' refers to the stockpile of the product 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 course of business operations. The assets which firm store as inventory in anticipation of need are (i) raw materials, (ii) work-in-process (semi finished goods) and (iii) finished goods. The raw material inventory contains items that are purchased by the firm from others and are converted into finished goods through the manufacturing (production) process. They are an important input of the final product. The work-in-process inventory consists of items currently being used in the production process. They are normally partially or semi-finished goods that are at various stages of production in a multi-stage production process. Finished goods represent final or completed products, which are available for sale. The inventory of such goods consists of items that have been produced but are yet to be sold.

The term 'inventory' refers to the stockpile of the product a firm is offering for sale and the components that make up the product.

Inventory, as a current asset, differs from other current assets. Because not only financial managers, but all the functional areas, finance, marketing, production, and purchasing, are involved. The views concerning the appropriate level of inventory would differ among the different functional areas. The job of the functional manager is to reconcile the conflicting viewpoints of the various functional areas regarding the appropriate inventory levels in order to fulfill 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.

The question of managing inventories arises only when the company holds inventories. Maintaining inventories involves tying up of the company's funds and incurrance of storage and handling costs. If it is expensive to maintain inventories, why do companies hold inventories? There are three general motives for holding inventories.

- Transactions motive emphasizes the need to maintain inventories to facilitate smooth production and sales operations.

- Precautionary motive necessitates holding of inventories to guard against the risk of unpredictable changes in demand and supply forces and other factors.
- Speculative motive influences the decision to increase or reduce inventory levels to take advantage of price fluctuations.

Efficient firms constantly try to make production cycle smaller by improving their production techniques.

A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. It is not possible for a company to procure raw materials whenever it is needed. A time lag exists between demand for materials and its supply. Also, there exists gap between demand for materials and its supply. Also there exists uncertainty in procuring raw materials in time on many occasions. The procurement of materials may be delayed because of such factors as strike, transport disruption or short supply. Therefore, the firm should maintain sufficient stock of raw materials at a given time to streamline production.

Work-in-process inventory builds up because of the production cycle. Production cycle is the time span between introduction of raw material into production and emergence of finished products at the completion of production cycle. Till production cycle completes, stock of work-in process has to be maintained. Efficient firms constantly try to make production cycle smaller by improving their production techniques.

Stock of finished goods has to be held because production and sales are not instantaneous. A firm cannot produce immediately when goods are demanded by customers. Therefore, to supply finished goods on a regular basis, their stock has to be maintained.

Inventories are important to the management of an enterprise primarily because of the direct impact, which they have upon the firm's profits.

Financial managers are concerned with every aspect of inventory management that is controllable from the standpoint of reducing liquidity risks and increasing profits for the owners. Inventories are important to the management of an enterprise primarily because of the direct impact, which they have upon the firm's profits. Inventories affect firm's profits in several ways. Firstly, both over-investment and under-investment in inventories have harmful effects on the enterprises. Holding excessive stock immobilizes capital resources. The immediate consequence of over-investment is the freezing up of funds in excessive stocks and non-availability of these resources for meeting current obligations or pressing commitments. Moreover, too much inventory reduces the profit margin in that carrying costs viz., costs of handling, insurance, recording and inspection and, in turn, costs of doing business are increased for extra load of inventories. Again, under-investment in inventory i.e., too little inventory has also some adverse effects. Under-investment creates frequent production hold-ups or delays and failures to meet delivery commitments to customers. At the same time, the delays and shut-downs boost-up cost of production which, in turn, reduces profit margin. Secondly, the rate at which inventories move through the production and distribution processes also affects the cost of doing business.

It is therefore, important for financial management to determine the correct amount of working capital to invest in inventory at any one time. But the question is : what is the appropriate size of inventory ? No standard set of rules can be formulated and offered as a ready solution for all enterprises and in all circumstances. The nature of the business activity, location of the sources of materials and services, as also of the sales outlets, reliability on the sources of supply, speed and efficiency of transport and communication facilities etc. influence the inventory levels.

Objectives of Inventory Management

In the context of the inventory management, the firm is faced with the problem of meeting two conflicting needs :

- To maintain a large size of inventory for efficient and smooth production and sales operations.
- To maintain a minimum investment in inventories to maximize profitability.

The aim of inventory management, thus, should be to avoid excessive and inadequate levels of inventories and to maintain sufficient inventory for the smooth production and sales operations. Efforts should be made to place an order at the right time with the right source to acquire the right quantity at the right price and quality. An effective inventory management should -

- ensure a continuous supply of raw materials to facilitate uninterrupted production,
- maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes,
- maintain sufficient finished goods inventory for smooth sales operation and efficient customer service,
- minimize the carrying cost and time, and
- control investment in inventories and keep it at an optimum level.

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 maximization of the owner's wealth. It was indicated earlier that in order to minimize 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 minimize investments in inventory, and

(ii) to meet demand for the product by efficiently organizing 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 minimize investment in inventory implies that maintaining inventory involves costs, such that the smaller the inventory, the lower is the cost to the firm. But inventories also provides benefits to the extent that they facilitate the smooth functioning of the firm : the larger the inventory, the better it is from this viewpoint. Obviously, the financial mangers should aim at a level of inventory which will reconcile these conflicting elements. That is to say, an optimum level of inventory should be determined on the basis of the trade-off between costs and benefits associated with the levels of inventory.

Advantage of Holding Optimum Level of Inventory

The major benefits of holding inventory are the basic functions of inventory.

The major benefits of holding inventory are the basic functions 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 or uncouple the various activities of a firm so that all do not have to be pursued at exactly the same rate. The key activities are : (i) purchasing, (ii) production, and (iii) selling. Inventories permit short-run relaxation so that each activity may be pursued efficiently. Stated differently, 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 of them can be operated at the most efficient rate. This has several beneficial effects on the firm's operations. Another way of saying it is that the three types inventory, namely raw materials, work-in -process and finished goods, perform certain useful functions. Alternatively, rigid tying (coupling) of purchase and production to sales schedules is undesirable in the short-run as it will deprive the firms of certain benefits. The effects of uncoupling (maintaining inventory) are as follows :

Advantage in Purchasing

If the purchasing of raw materials and other goods is not tied to production/sales, i.e. 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 usage in production or the sales level. This will enable it to avail of discounts that are available in the bulk purchases. Moreover, it will lower the ordering cost as fewer acquisitions would be made. There will, thus, be a significant saving in costs. Second, firma can purchase goods before anticipated or announced price increases. This will lead to a decline in 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.

Advantage in Work-in Process

The inventory of work-in-process performs two functions. In the first place, it is necessary because production processes are not instantaneous. The amount of such inventory depends upon technology and the efficiency of production. The larger the steps involved in the production process, the larger the work-in process inventory and vice-versa. By shortening the production time, efficiency of the production process can be improved and the size of this type of inventory reduced. In a multi-stage production process, the work-in process inventory serves a second purpose also. It uncouples the various stages of production so that all of them do not have to be performed at the same rate. The stages involving higher set-up costs may be most efficiently performed in batches with a work-in process inventory accumulated during a production run.

Advantage in Production

Finished goods inventory serves to uncouple production and sale. This enables production at a rate different from that of sales. That is, production can be carried on at a rate higher or lower than the sales rate. This would be of special advantage to firms with a seasonal sales pattern. In their case, the sales rate will be higher than the production rate during a part of the year (peak season) and lower during the off-season. Thus, inventory helps a firm to co-ordinate its production scheduling so as to avoid disruptions and the accompanying expenses. In brief, since inventory permits least cost production scheduling, production can be carried on more efficiently.

Production can be carried on at a rate higher or lower than the sales rate.

Advantage in Sales

The maintenance of inventory also helps a firm to enhance its sales efforts. For one thing, 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 lag depending upon the production process. If the firm has inventory, actual sales will not have to depend on 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 to meet customer demands. Moreover, in the case of firms 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 loss of sales during the peak season.

Inventory serves to bridge the gap between current production and actual sales.

Finally, the inventory of work-in-process performs two functions. In the first place, it is necessary because production processes are not instantaneous. The amount of such inventory depends upon technology and the efficiency of production. The larger the steps involved in the production process, the larger the work-in-process inventory and vice-versa. By shortening the production time, efficiency of the production process can be improved and the size of this type of reduced inventory.

The larger the steps involved in the production process, the larger the work-in-process inventory and vice-versa.

Review Questions

Short Questions

1. What do you mean by inventory and inventory management ? Explain.
2. Discuss the various types of inventory held by a manufacturing enterprise.
3. State the significance of inventory management.
4. Explain the necessity of holding inventory.

Broad Questions

5. What are the objectives of inventory management ? Explain.
6. What is an optimum level of inventory ? Discuss the benefits of holding optimum level of inventory.
7. “The management of inventory must meet two opposite needs”. What are they ? How is a balance made in these two opposite needs.

Lesson-7: Inventory Management: Elements and Techniques

After attentively studying the lesson 7, you should be able -

- To know about the elements of inventory management;
- To learn about the techniques of inventory management and
- To analyze the investments made in inventories.

Elements of Inventory Management

Inventory management consists of two important elements namely inventory planning and inventory control.

Inventory Planning

It is important for financial management to determine the correct amount of working capital to invest in inventory at any one time. But the question is : what is the appropriate size of inventory ? No standard set of rules can be formulated and offered as a ready solution for all enterprises and in all circumstances. The nature of the business activity, location of the sources of materials and services, as also of the sales outlets, reliability on the sources of supply, speed and efficiency of transport and communication facilities etc. influence the inventory levels.

Inventory management consists of two important elements namely inventory planning and inventory control.

Here lies the necessity of inventory planning. Inventory planning not only includes investments of working capital in inventories of all types at one point of time; but it also includes the amount and types of inventories to be maintained for the smooth production of a manufacturing enterprise. Therefore, inventory planning covers the fixation of the following policies :

- (i) Inventory turnover policy
- (ii) Finished goods policy
- (iii) Purchase and procurement policy
- (iv) Inventory accounting policy.

Each of these policies is discussed below :

(i) Inventory Turnover Policy

Inventory turnover is a test of efficient inventory management which signifies the number of times inventory is sold during a particular period. A high inventory turnover is a sign of good inventory management; while a low inventory turnover is a symptom of bad inventory management. Investment of working capital in inventory will be less for sales volume if inventory turnover is higher. On the other hand, investment of working capital in inventory will be higher for sales

Inventory turnover is a test of efficient inventory management which signifies the number of times inventory is sold during a particular period.

volume. Therefore, fixation of proper inventory policy is a great concern of inventory planning.

(ii) Finished Goods Policy

The question of fixation of finished goods policy arises because of sales of inventory and costs of inventories.

While fixing finished goods policy, the inventory management should take into consideration the costs involved in storing inventories like rent of the ware house, insurance premium, inventory handling and distribution costs, maintenance etc. The question of fixation of finished goods policy arises because of sales of inventory and costs of inventories. Therefore, fixation of proper finished goods policy is a must for effective inventory planning.

(iii) Purchase and Procurement Policy

The main objective of purchasing and procuring raw materials, supplies, spares etc. is to ensure continuity of their supplies and at the same time to reduce the ultimate costs of finished goods. For ensuring this, there are a number of parameters viz., right price, right quantity, right quality, right time, right source, right terms and conditions etc. Therefore, fixing proper purchase and procurement policy is a sine-qua-non for efficient inventory planning.

(iv) Inventory Accounting Policy

Proper inventory accounting i.e. store keeping and recording of inventories and also for right pricing of them is a precondition of efficient inventory management. Material costing is very significant in terms of valuation of the cost of materials consumed by the production department. Therefore, fixing proper inventory accounting policy is a must for efficient inventory management.

Inventory Control and Its Approaches

Inventory control refers to the physical control of inventory as well as control of over-investment in the inventory.

Inventory control refers to the physical control of inventory as well as control of over-investment in the inventory. Inventory is significant for the efficient inventory management. To control over-investment in inventories, preparing proper inventory budget, production budget, purchase budget and sales budget is very significant. To control physical inventory, ABC analysis, stores level control, determination economic order quantity, reorder level etc. are the vital ones

Techniques of Inventory Management

To manage inventories efficiently, answers should be sought to the following two questions :

- How much should be ordered ?
- When should it be ordered ?

The first question, *how much to order*, relates to the problem of determining *economic order quantity* (EOQ), and is answered with an analysis of costs of maintaining certain level of inventories. The second

question, *when to order*, arises because of uncertainty and is a problem of determining the re-order point.

Determination of Economic Order Quantity (EOQ)

Economic Order Quantity is that order quantity of inventories that will minimize inventory costs. The EOQ is a model which can be expressed as follows :

$$EOQ = \sqrt{\frac{2(O)(T)}{(C)(PP)}} \quad \text{Where } O = \text{Fixed order cost per order}$$

T = Annual sales in units

C = % cost of carrying

PP = Purchase price per unit

The above formula indicates two types of costs viz., ordering costs and carrying costs. Such costs are explained below:

a) Ordering Costs

The term ordering costs is used in case of raw materials or supplies and includes the whole costs of acquiring raw materials. They include costs incurred in the following activities: requisitioning, purchase ordering, transporting, receiving, inspecting and storing. Ordering costs increased in proportion to the number of orders placed. Hence, the more frequently inventory is acquired, the higher the firm's ordering costs on the other hand, if the firm maintains larger inventory levels, there will be few orders placed and as such ordering costs will be relatively small. Thus, ordering costs decrease with increasing size of inventory.

b) Carrying Costs

Costs incurred for maintaining a given level of inventory are called carrying costs. They include storage, insurance, taxes, handling, deterioration and obsolescence. The storage costs consist of ware housing costs, store handling costs and clerical and staff services costs. Such costs vary with the size of inventory. The behavior of such costs is contrary to that of ordering costs, which decline with increase in inventory size. The economic size of inventory would therefore, depend on trade-off between carrying costs and ordering costs.

Ordering and Carrying Costs Trade-off

The optimum inventory size is commonly referred to as EOQ. It is that order size at which annual total costs of ordering and handling are the minimum.

Economic Order Quantity is that order quantity of inventories that will minimize inventory costs.

The term ordering cost is used in case of raw materials or supplies and includes the whole costs of acquiring raw materials.

Costs incurred for maintaining a given level of inventory are called carrying costs.

It is that order size at which annual total costs of ordering and handling are the minimum.

In general, carrying costs increase as the level of inventory rises; but ordering costs and stock out costs decline with larger inventory holdings.

Besides, ordering and carrying costs there are stock out costs which are also included in inventory costs. In general, carrying costs increase as the level of inventory rises; but ordering costs and stock out costs decline with larger inventory holdings.

Determination of various Inventory Costs

$$\begin{aligned} \text{Total Inventory Cost (TIC)} &= \\ &= \text{Total Carrying Costs} + \text{Total ordering costs} \\ &= (\text{Carrying cost per unit}) (\text{Average units in inventory}) + (\text{Cost per order}) \\ & \quad (\text{Number of orders}) \\ &= (C \times PP) \times (Q/2) + (O) (T/Q) \end{aligned}$$

The variables in the equation are defined as follows:

C = Carrying costs as a percent of the purchase price of each inventory item.

PP = Purchase price, or cost, per unit.

Q = Number of units purchased with each order.

T = Total demand, or number of units sold, per period.

O = Fixed costs per order.

Re-order Point

The re-order point is that inventory level at which an order should be placed to replenish the inventory.

The problem, how much to order, is solved by determining the economic order quantity, yet the answer should be sought to the second problem, when to order. This is a problem of determining the *re-order-point*. The re-order point is that inventory level at which an order should be placed to replenish the inventory. To determine the re-order under *certainty*, we should know : (a) lead time, (b) average usage, and (c) economic order quantity. *Lead time* is the time normally taken in replenishing inventory after the order has been placed. By *certainty* we mean that usage and lead time do not fluctuate. Under such a situation, re-order point is simply that inventory level which will be maintained for consumption during the lead time. That is :

$$\text{Re-order point} = \text{Lead time} \times \text{Average usage}$$

Safety Stock

In order guard against the stock out, the firm may maintain a safety stock – some minimum or buffer inventory as cushion against expected increased usage and/or delay in delivery time.

The re-order point is determined under the assumption of certainty. But it is difficult to predict usage and lead time accurately. The demand for materials may fluctuate from day to day, week to week or month to month. Similarly, the actual delivery time may be different from the normal lead time. If the actual usage increases or the delivery of inventory is delayed, the firm can face a problem of stock out which can prove to be costly for the firm. Therefore, in order guard against the stock out, the firm may maintain a safety stock – some minimum or buffer inventory as cushion against expected increased usage and/or delay in delivery time.

Safety stocks are held to avoid shortages arisen from: (i) demand increases and (ii) shipping delays are caused. Such safety stocks also involves costs. The cost of carrying safety stocks is equal to the percentage cost of carrying inventories times the purchase price per unit times the number of units held as the safety stock. Thus :

Cost of Safety Stock (SS) = (C) (PP) (SS)

Selective Inventory Control: ABC Analysis

Usually a firm has to maintain several types of inventories. It is not desirable to keep the same degree of control on all the items. The firm should pay maximum attention to those items whose value is the highest. The firm should, therefore, classify inventories to identify which items should receive the most effort in controlling. The firm should be selective in its approach to control investment in various types of inventories. This analytical approach is called the ABC analysis and tends to measure the significance of each item of inventories in terms of its value. The high-value items are classified as 'A items' and would be under the tightest control. 'C items' represent relatively least value and would be under simple control. 'B items' fall in between these two categories and require reasonable attention of management.

The firm should be selective in its approach to control investment in various types of inventories.

The following steps are involved in implementing the ABC analysis :

- Classify the items of inventories, determining the expected use in units and the price per unit for each item.
- Determine the total value of each item by multiplying the expected units by its units price.
- Rank the items in accordance with the total value, giving first rank to the item with highest total value and so on.
- Compute the ratios (percentage) of number of units of each item to total units of all items and the ratio of total value of each item to total value of all items.
- Combine items on the basis of their relative value to form three categories – A, B and C.

Investment in Inventories and Analysis thereof

It is the major responsibility of the financial manager to over-see the management of inventory since inventories represent investment of the firms' large funds in practice. A decision to determine or change the level of inventory is an investment decision. The analysis should therefore involve an evaluation of the profitability of investment in inventory. The goal of the inventory policy should be maximization of the firm's value. The inventory policy will maximize the firm's value at a point at which marginal (incremental) return from the investment in inventory equals the marginal (incremental) cost of funds used to finance the investment in inventory. As stated in the earlier Lesson, the cost of funds is the required rate of return to the suppliers of funds, and it depends on the risk of the investment opportunity.

The inventory policy will maximize the firm's value at a point at which marginal (incremental) return from the investment in inventory equals the marginal (incremental) cost of funds used to finance the investment in inventory.

Incremental Analysis

The incremental analysis should be used to compute the values of operating profit, investment in inventory, rate of return and cost of funds.

The investment in inventory should be analyzed involving the following four steps :

- Estimation of operating profit
- Estimation in investment in inventory
- Estimation of the rate of return on investment in inventory
- Comparison of the rate of return on investment with the cost of funds.

The incremental analysis should be used to compute the values of operating profit, investment in inventory, rate of return and cost of funds. A change in the inventory policy is desirable if the incremental rate of return exceeds the required rate of return.

If a firm increases its investment in inventories, its risk increases.

Choice of Policy The choice of the inventory policy by the management of a corporate firm will depend on the required rate of return, k , on incremental (or marginal) investment in inventories. The concept of the required rate of return, k , has been discussed in earlier Lesson. At this stage, we shall emphasize that the required rate of return is not the borrowing rate. It depends on the risk of investment. Higher the risk, higher the rate of return. If a firm increases its investment in inventories, its risk increases. For example, the company may not be able to realize receivables, or inventory may become obsolete if it cannot sell goods because of recession or other unfavorable market conditions.

The firm should invest in higher level of inventory if $r \geq k$.

Thus, the choice of inventory policy will depend on a comparison of the expected rate of return and the required rate of return. The firm should invest in higher level of inventory if $r \geq k$.

Problems and Solutions

Problem - 1

The Homemade Bread Company buys and then sells (as bread) 2.6 million bushels of wheat annually. The wheat must be purchased in multiples of 2,000 bushels. Ordering costs are \$5,000 per order. Annual carrying costs are two percent of the purchase price of \$5 per bushel. The delivery time is six weeks.

- a. What is the EOQ ?
- b. At what inventory level should an order be placed ?
- c. What are the total inventory costs ?

Solution

$$\begin{aligned} \text{a. EOQ} &= \sqrt{\frac{2 \times 0 \times T}{C \times PP}} \\ &= \sqrt{\frac{(2)(\$5,000)(2,600,000)}{(0.02)(\$5.00)}} \\ &= \underline{509,902 \text{ bushels}} \end{aligned}$$

Because the firm must order in multiples of 2,000 bushels, it should order in quantities of \$10,000 bushels.

$$\begin{aligned} \text{b. Average weekly sales} &= 2,600,000/52 \\ &= 50,000 \text{ bushels.} \end{aligned}$$

$$\begin{aligned} \text{Reorder point} &= 6 \text{ weeks' sales} \\ &= \underline{6 (50,000)} \\ &= \underline{300,000 \text{ bushels}} \end{aligned}$$

c. Total inventory costs :

$$\begin{aligned} \text{TIC} &= (C)PP \left(\frac{Q}{2} \right) + O \left(\frac{T}{Q} \right) \\ &= (0.02)(\$5) \left(\frac{510,000}{2} \right) + (\$5,000) \left(\frac{2,600,000}{510,000} \right) \\ &= \$25,500 + \$25,490.20 \\ &= \underline{\$50,990.20} \end{aligned}$$

Problem - 2

Vostick Filter Company is a distributor of air filters to retail stores. Its buys its filters from several manufacturers. Filters are ordered in lot sizes of 1,000 and each order costs \$40 to place. Demand from retail stores is 20,000 filters per month, and carrying cost is \$.10 a filter per month.

- What is the optimal order quantity with respect to so many lot sizes?
- What would be the order quantity if the carrying cost were \$.50 per month ?
- What would be the optimal order quantity if ordering costs were \$ 10 ?

Solution

$$a. Q^* = \sqrt{\frac{2(20)(40)}{100}} = 4$$

Carrying costs = \$.10 x 1,000 = \$100. The optimal order size would be 4,000 filters, which five orders a month.

$$b. Q^* = \sqrt{\frac{2(20)(40)}{50}} = 5.66$$

Since the lot size is 1,000 filters, the company would order 6,000 filters each time. The lower the carrying cost, the more important ordering costs become relatively, and the larger the optimal order size.

$$c. Q^* = \sqrt{\frac{2(20)(10)}{100}} = 2$$

The lower the order cost, the more important carrying costs become relatively and the smaller the optimal order size.

Problem - 3

The following inventory data have been established for the Thompson Company :

- (1) Orders must be placed in multiples of 100 units.
- (2) Annual sales are 338,000 units.
- (3) The purchase price per unit is \$6.
- (4) Carrying cost is 20 percent of the price of goods.
- (5) Fixed order cost is \$48.
- (6) Three days are required for delivery.
 - a. What is the EOQ ?
 - b. How many orders should an Thompson place each year ?
 - c. At what inventory level should an order be made ?
 - d. Calculate the total cost of ordering and carrying inventories if the order quantity is (1) 4,000 units, (2) 4,800 units, or (3) 6,000 units. (4) What are the total costs if the order quantity is the EOQ ?

Solution

$$(a) EOQ = \sqrt{\frac{2(O)(T)}{(C)(PP)}}$$

Where :

O = Fixed cost per Order

T = Annual Sales in Units

C = % Cost of Carrying Inventory

PP = Purchase price per unit

$$\begin{aligned} \therefore \text{EOQ} &= \sqrt{\frac{2(48)(3,38,000)}{(.20)(6)}} \\ &= \sqrt{2,70,40,000} \\ &= \underline{5,200 \text{ units}} \end{aligned}$$

$$(b) \text{ No. of order to be placed} = \frac{\text{Annual Sales}}{\text{EOQ}} = \frac{3,38,000}{5,200} = \underline{65}$$

(c) Reorder Point = Safety Stock + (Lead Time x Usage Rate) – Goods in Transit

$$\begin{aligned} &= 12,000 + \left(2x \frac{3,38,000}{52} \right) - 10,400 \\ &= 12,000 + 13,000 - 10,400 \\ &= 14,600 \text{ Units} \end{aligned}$$

$$\begin{aligned} \text{Goods in Transit} &= \text{EOQ} \times \text{Lead Time} \\ &= 5,200 \times 2 = 10,400 \text{ Units} \end{aligned}$$

(d) (i) Total Inventory Cost (TIC) = Total Carrying Cost (TCC) + Total Ordering Cost (TOC)

$$\begin{aligned} &= (C)(PP)(A) + (O) \left(\frac{T}{Q} \right) \\ &= (.20)(6) \left(\frac{4,000}{2} \right) + (48) \frac{3,38,000}{4,000} \\ &= \$2,400 + \$4,056 \\ &= \underline{\$6,456} \end{aligned}$$

(ii) TIC = TTC + TOC

$$\begin{aligned} &= (.20)(6) \left(\frac{4,800}{2} \right) + (48) \left(\frac{3,38,000}{4,800} \right) \\ &= \$2,880 + \$3,380 \\ &= \underline{\$6,260} \end{aligned}$$

(iii) TIC = TCC + TOC

$$\begin{aligned} &= (.20)(6) \left(\frac{6,000}{2} \right) + (48) \left(\frac{3,38,000}{6,000} \right) \\ &= \$3,600 + \$2,704 \\ &= \underline{\$6,304} \end{aligned}$$

(iv) TIC = TCC + TOC

$$\begin{aligned} &= (.20)(6) \left(\frac{5,200}{2} \right) + (48) \left(\frac{3,38,000}{5,200} \right) \\ &= \$3,120 + \$3,120 \\ &= \underline{\$6,240} \end{aligned}$$

Review Questions

Short Questions

1. What is EOQ ? How it is determined ?
2. What are ordering costs ? Give examples.
3. What are carrying costs ? Give examples.
4. What do you mean by inventory planning ? Explain.
5. What is inventory control ? Explain.
6. What is re-order point ? Discuss. How it is computed.
7. What is safety stock ? Explain. How it is determined ?
8. How would you analyze investment in inventory ?
9. What is ABC control of inventory ? Explain.
10. What is lead time ? How it is calculated ?

Broad Questions

11. Discuss briefly the techniques involved in inventory management.
12. Explain the steps involved in analyzing investment in inventories. Illustrate with an example.

Review Problems

Problem - 1

Two components, A and B are, used as follows :

Normal usage	:	50 units each per week
Minimum usage	:	25 units each per week
Maximum usage	:	75 units each per week
Re-order quantity	:	A : 300 units; B : 500 units
Re-order period	:	A : 4 to 6 weeks; B : 2 to 4 weeks

Calculate for each component :

- (a) Reorder level
- (b) Minimum level
- (c) Maximum level
- (d) Average stock level

Problem - 2

Green Thumb Garden Centers sells 240,000 bags of lawn fertilizer annually. The optimal safety stock (which is on hand initially) is 1,200 bags. Each bag costs (Green Thumb \$4, inventory carrying costs are 20 percent, and the cost of placing an order with its supplier is \$25.

- (a) What is the Economic Ordering Quantity ?
- (b) What is the maximum inventory of fertilizer ?
- (c) What will Green Thumb's average inventory be ?
- (d) How often must the company order ?

Problem - 3

The Hedge Corporation manufactures only one product : planks. The single raw material used in making planks is the dint. For each plank

manufactured, 12 dints are required. Assume that the company manufactures 150,000 planks per year, that demand for planks is perfectly steady throughout the year, that it costs \$200 each time dints are ordered, and that carrying costs are \$8 per dint per year.

- a. Determine the economic order quantity of dints.
- b. What are total inventory costs for Hedge (carrying costs plus ordering costs) ?
- c. How many times per year would inventory be ordered ?

Case Study

Now Ray Smith wants you to take a look at the company's inventory position because he thinks that inventories might be too high as a result of the manager's tendency to order in large quantities. Smith has decided to examine the situation for one key product – fly rods, which cost \$320 each to purchase and prepare for sale. Annual sales of the product are 2,500 units (rods), and the annual carrying cost is ten percent of inventory value. The company has been buying 500 rods per order and placing another order when the stock on hand falls to 100 rods. Each time SSP orders, it incurs a cost equal to \$64 Sales are uniform throughout the year.

- a. Smith believes that the EOQ model should be used to help determine the optimal inventory situation for this product. What is the EOQ formula, and what are the key assumptions underlying this model ?
- b. What is the formula for total inventory costs ?
- c. What is the EOQ for the fly rods ? What will be the total inventory costs for this product if the EOQ is produced ?
- d. What is SSP's added cost if it orders 500 rods rather than the EOQ quantity ? What if it orders 750 rods each time ?

Lesson-8: Accounts Receivable Management and Factoring

After successful completion of the lesson 8, you should be able -

- To form a clearcut concept on accounts receivable and its management;
- To realize the objectives and significance of accounts receivable management;
- To understand how an optimum credit policy can be formulated;
- To identify and explain the credit and collection policies and procedures and
- To get acquainted with the concept and costs and benefits involved in factoring.

Concept of Accounts Receivable and Its Management

Accounts receivables arise when a firm sells its products or services on credit and does not receive cash at the time of sale.

Accounts receivables arise when a firm sells its products or services on credit and does not receive cash at the time of sale. It is an essential marketing tool which acts as a bridge for the movement of goods through production and distribution stages to customers. A firm grants trade credit to protect its sales from the competitors and to attract the potential customers to buy its products services on favorable terms and conditions. Trade credit creates accounts receivables which the firm expects to collect in the near future. Such accounts receivables have three characteristics which are as follows :

- (i) They involve an element of risk which should be carefully analyzed.
- (ii) They are based on economic value. To the buyer, the economic value in goods and services passes immediately at the time of sale; while the seller expects an equivalent value to be received in near future.
- (iii) They imply future period since the collection of receivables will be made in the near future.

Accounts receivables management refers to taking decisions regarding credit and collection policy of a firm.

Accounts receivables management refers to taking decisions regarding credit and collection policy of a firm. The management of investment of funds in accounts receivables is also known as receivable management. The general liquidity management goal of a firm is to use cash resources as economically as possible in expanding receivables, without impairing sales and the chance for increasing profits. Credit and collection policies significantly influence requirements. Sound and proper credit and collection policies are the pre-requisites to a good accounts receivables policy. Therefore, accounts receivable management deals with the formulation and implementation of sound credit and collection policy.

Objective and Significance of Accounts Receivable Management

The main objective of receivables management is to promote sales and profits until that point is reached where the return on investment in further funding of receivables is less than the cost of funds raised to finance the additional credit (cost of capital). The specific costs and

benefits which are relevant to the determination of the objectives of receivables management are briefly discussed below :

Relevant Costs The major types of cost associated with the extension of credit and accounts receivables are collection costs, capital costs, delinquency costs and default cost. Collection costs are the administrative costs incurred in collecting the receivables from the customers to whom credit sales have been made. Capital costs are the cost of financing the investment made in accounts receivables. Delinquency cost arises out of the failure of the customers to meet their obligations when payment on credit sales becomes due. Finally, default cost arises due to non-recovery of the overdue of the customers because of their inability to pay.

Relevant Benefits The benefits arises from credit sales are the increased sales and profits anticipated because of a more liberal policy. Thus, it is clear that investment in receivables involves both costs and benefits. The extension of trade credit has a major impact on sales, costs and profitability. It is to be remembered here that the costs and benefits to be compared are marginal costs and benefits. The firm should only consider the incremental (additional) benefits and costs that result from a change in the receivables or trade credit policy.

Accounts receivables management is very much significant mainly in case of manufacturing as well as service rendering concerns where credit sales cannot be avoided. This is because of the fact that a proper and sound accounts receivables policy of a firm tends to reduce the need for working capital for operations, boost up sales promotion, reduce the cost of doing business and maintain good customer relations. Funds locked up in accounts receivables have opportunity costs. Over-investment in accounts receivables will amount to denial of funds for more productive uses. Moreover, excessive credits for an unusually long period are open invitations to incompetence and the consequent failure of customers. Therefore, proper and sound receivable management is a must for a firm.

Credit Policy and Its Formulation

Definition of a Credit Policy

The term credit policy is used to refer to the combination of the three decision variables namely – (i) Credit standard, (ii) Credit terms and (iii) Collection efforts, on which the financial manager of a firm has influence.

(i) Credit Standard : These are the criteria to decide the types of customers to whom goods and services could be sold on credit terms. If a firm has more slow paying customers, its investment in accounts receivables will be higher. In that case, the firm will also be exposed to higher risk of default.

(ii) Credit Terms : These refer to the duration of credit and terms of payments by customers. Investment in accounts receivables will be higher if customers are allowed more period for making payments.

(iii) Collection Efforts : These determine the actual collection period. The lower the collection period the lower the investment in accounts receivables and vice-versa

Goals of Credit Policy

A firm may follow a lenient or a stringent credit policy.

A firm may follow a lenient or a stringent credit policy. The firm following a lenient credit policy tends to sell on credit to customers on very liberal terms and standards; credits are granted for longer periods even to those customers whose credit worthiness is not fully known or whose financial position is doubtful. In contrast, a firm following a stringent credit policy sells on credit on a highly selective basis only to those customers who have proven credit worthiness and who are financially strong. Therefore, the goals of credit policy is to trade-off the lenient credit policy and stringent credit policy. That means the firms should follow credit policies ranging between stringent and lenient.

Formulation of an Optimum Credit Policy

Optimum credit policy is one which maximizes the value of the firm.

Optimum credit policy is one which maximizes the value of the firm. The value of the firm is maximized when the incremental rate of return, also called the marginal rate of return of an investment is equal to the incremental cost of firm, also called the marginal cost of capital used to finance the investment. The incremental rate of return can be calculated as incremental operating profit divided by the incremental investment in receivables. The incremental cost of funds is

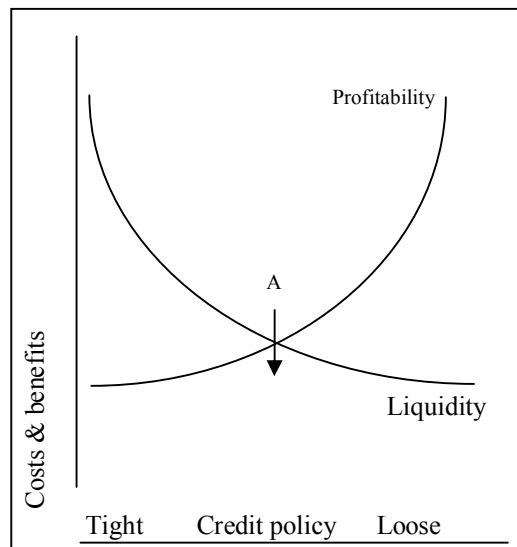


Figure – 1 : Costs of Credit Policy necessarily the optimum credit policy.

Higher the risk of investment, higher the required rate of return.

the rate of return required by the suppliers of funds, given the risk of investment in accounts receivables. It is to be noted here that the required rate of return is not equal to the borrowing rate. Higher the risk of investment, higher the required rate of return.

a) An Optimum Credit Policy : A Cost Benefit Analysis

A firm's operating profit is maximized when total cost is minimized for a given level of revenue. Credit policy at point A in Figure-1 represents the maximum operating profit (since total cost is minimum). But it is not

A firm's operating profit is maximized when total cost is minimized for a given level of revenue.

As the firm loosens its credit policy, its investment in accounts receivable becomes more risky because of increase in slow-paying and defaulting accounts. Thus the required rate of return is an upward sloping curve.

In sum, we may state that the goal of the firm's credit policy is to maximize the value of the firm. To achieve this goal, the evaluation of investment in accounts receivable should involve the following four steps :

- Estimation of incremental operating profit
- Estimation of incremental investment in accounts receivable
- Estimation of incremental rate of return of investment
- Comparison of the incremental rate of return with the required rate of return.

b) Credit Policy Variables

In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. The major controllable decision variables include the following :

- Credit standards and analysis
- Credit terms
- Collection policy and procedures

Credit Standards

Credit standards are the criteria, which a firm follows in selecting customers for the purpose of credit extension. The firm may have tight credit standards; that is, it may sell mostly on cash basis, and may extend credit only to the most reliable and financially strong customers. Such standards will result in no bad-debt losses, and less cost of credit administration. But the firm may not be able to expand sales. The profit sacrificed on lost sales may be more than the costs saved by the firm. On the contrary, if credit standards are loose, the firm may have larger sales. But the firm will have to carry larger receivable. The costs of administering credit and bad-debt losses will also increase. Thus, the choice of optimum credit standards involves a trade-off between incremental return and incremental costs.

Credit Analysis

The average collection period (ACP) determines the speed of payment by customers.

Credit standards influence the quality of the firm's customers. There are two aspects of the quality of customers : (i) the time taken by customers to repay credit obligation and (ii) the default rate. The *average collection period* (ACP) determines the speed of payment by customers. It measures the number of days for which credit sales remain outstanding. The longer the average collection period, the higher the firm's investment in accounts receivable. *Default rate* can be measured in terms of bad-debt losses ratio – the proportion of uncollected receivable. Bad-debt losses ratio indicates *default risk*. Default risk is the likelihood that a customer will fail to repay the credit obligation. On the basis of the past practice and experience, the financial or credit manager should be able to form a reasonable judgment regarding the chances of default. To estimate the probability of default, the financial or credit manager should consider five C's viz., (i) character, (ii) collateral, (iii) capital, (iv) capacity and (v) condition.

Default rate can be measured in terms of bad-debt losses ratio – the proportion of uncollected receivable.

- **Character** : It refers to the customer's willingness to pay. The financial or credit manager should judge whether the customers will make honest efforts to honor their credit obligations. The moral factor is of considerable importance in credit evaluation in practice.
- **Collateral** : Here collateral refers to the security given by the loan applicants in favor of the loan giving agency. Generally, collateral in the form of inventories or any other fixed assets are pledged against loan. The loan giving agency while appraising loan application also examines the security.
- **Capital** : Capital refers to the total amount of both the fixed and working capital invested by a businessman in his business. Such capital may be either owned capital or debt capital or both. The question of capital arises in case of an existing business.
- **Capacity** : It refers to the customer's ability to pay. Ability to pay can be judged by assessing the customer's capital and assets which he may offer as security. Capacity is evaluated by the financial position of the firm which is indicated by analysis of ratios and trends in firm's cash and working capital position.
- **Condition** : It refers to the prevailing economic and other conditions which may affect the customer's ability to pay. Adverse economic conditions can affect the ability or willingness of a customer to pay. An experienced financial or credit manager will be able to judge the extent and genuineness to which the customer's ability to pay is affected by the economic conditions.

Credit Terms

The stipulations under which the firm sells on credit to customers are called *credit terms*. These stipulations include : (a) the credit period and (b) the cash discount.

The stipulations under which the firm sells on credit to customers are called credit terms.

Credit Period The length of time for which credit is extended to customers is called the credit period. It is generally stated in terms of a net date. A firm's credit period may be governed by the industry norms. But depending on its objective, the firm can lengthen the credit period. On the other hand, the firm may tighten its credit period if customers are defaulting too frequently and bad-debt losses are building up.

Cash Discounts A cash discount is reduction in payment offered to customers to induce them to repay credit obligations within a specified period of time, which will be less than the normal credit period. It is usually expressed as a percentage of sales. Cash discount terms indicate the rate of discount and the period for which it is available. If the customer does not avail the offer, he must make payment within the normal credit period.

In practice, credit terms would include : (i) the rate of cash discount, (b) the cash discount period, and (c) the net credit period. For example, credit terms may be expressed as '2/10, net 30'. This means that a 2 percent discount will be granted if the customer pays within 10 days; if he does not avail the offer he must make payment within 30 days.

A firm uses cash discount as a tool to increase sales and accelerate collections from customers. Thus the level of receivable and associated costs may be reduced. The cost involved is the discounts taken by customers.

Credit Policy Effects

In evaluating credit policy, there are five basic effects to consider :

1. *Revenue effects.* If the firm grants credit, then there will be a delay in revenue collections as some customers take advantage of the credit offered and pay later. However, the firm may be able to charge a higher price if it grants credit and it may be able to increase the quantity sold. Total revenues may thus increase.
2. *Cost effects.* Although the firm may experience delayed revenues if it grants credit, it will still incur the costs of sales immediately. Whether the firm sells for cash or credit, it will still have to acquire or produce the merchandise (and pay for it).
3. *The cost of debt.* When the firm grants credit, it must arrange to finance the resulting receivables. As a result, the firm's cost of short-term borrowing is a factor in the decision to grant credit.

4. *The probability of nonpayment.* If the grants credit, some percentage of the credit buyers will not pay. This can't happen, of course, if the firm sells for cash.
5. *The cash discount.* When the firm offers a cash discount as part of its credit terms, some customers will choose to pay early to take advantage of the discount.

Credit Collection Policy and Procedure

A collection policy is needed because all customers do not pay the firm's bills in time. Some customers are slow-payers while some are non-payers. The collection efforts should, therefore, aim at accelerating collections from slow-payers and reducing bad-debt losses. A collection policy should, therefore, ensure prompt and regular collection. Prompt collection is needed for fast turnover of working capital, keeping collection costs and bad debts within limits and maintaining collection efficiency. Regularity in collections keeps debtors alert, and they tend to pay their dues promptly.

The collection policy should lay down clear-cut collection procedures. The collection procedures for past dues or delinquent accounts should also be established in unambiguous terms. The slow-paying customers are needed to be handled very tactfully. Some of them may be permanent customers. The collection process initiated quickly, without giving any chance to them, may antagonize them, and the firm may lose them to competitors.

Monitoring Accounts Receivable

A firm needs to continuously monitor and control its receivable to ensure the success of collection efforts. Two traditional methods of evaluating the management of receivable are : (1) average collection period (ACP) and (2) aging schedule. These methods have certain limitations to be useful in monitoring receivable. A better approach is the *collection experience matrix*.

Average Collection Period

Average collection period is found as under -

$$ACP = \frac{\text{Debtors} \times 360}{\text{Credit Sales}}$$

The average collection period measures the quality of receivable since it indicates the speed of their collectability.

The average collection period so calculated is compared with the firm's stated credit period to judge the collection efficiency. An extended collection period delays cash inflows, impairs the firm's liquidity position and increases the chances of bad-debt losses. The average collection period measures the quality of receivable since it indicates the speed of their collectability.

There are two limitations of this method. *First*, it provides an average picture of collection experience and is based on aggregate data. For

control purposes, there is no need of specific information about the age of outstanding receivables. Second, it is susceptible to sales variations and the period over which sales and receivables have been aggregated. Thus, average collection period cannot provide a very meaningful information about the quality of outstanding receivable.

Aging Schedule

The aging schedule removes one of the limitations of the average collection period. It breaks down receivables according to the length of time for which they have been outstanding. Aging schedule provides more information about the collection experience. It helps to spot out the slow-paying debtors. However, it also suffers from the problem of aggregation, and does not relate receivables to sales of the same period.

Collection Experience Matrix

The major limitations of the traditional methods are that they are based on aggregated data and fail to relate outstanding receivables of a period with the credit sales of the same period. Thus, using the traditional methods, two analysts can come up with entirely different signals about the status of receivables if they aggregate sales and receivables data differently. This problem can be eliminated by using disaggregated data for analyzing collection experience. The key is to relate receivables to sales of the same period. When sales over a period of time are shown horizontally and associated receivables vertically in a tabular form, a matrix constructed. Therefore,, this method of evaluating receivables is called *collection experience matrix*.

Concepts, Costs and Benefits of Factoring

Factoring is a popular mechanism of managing, financing and collecting receivables in developed countries like USA and UK and has extended to a number of other countries in the recent past, including India and Bangladesh.

Concepts of Factoring

Factoring is a unique financial innovation. It is both a financial as well as a management support to a client. It is a method of converting a non-productive, inactive asset (i.e. receivable) into a productive asset (viz. cash) by selling receivables to a company that specializes in their collection and administration.

It is a method of converting a non-productive, inactive asset (i.e. receivable) into a productive asset (viz. cash) by selling receivables to a company that specializes in their collection and administration.

One can define factoring as “business involving a continuing legal relationship between a financial institution (the factor) and a business concern (the client) selling goods or providing services to trade customers (the customers) whereby the factors purchase the client’s accounts receivable and in relation thereto, control the credit, extended to customers and administers the sales lodger.” Factoring may also be defined as “a contract between the suppliers of goods/services and the factor under which (a) the supplier and its customers (debtors) other than those for the sale of goods bought primarily for their personal; family or

household use; (b) the factor is to perform at least two of the following functions – (i) finance for supplier, including loans and advance payments; (ii) maintenance of accounts (ledgering relating to the receivables); (iii) collection of accounts (ledgering relating to the receivables) and (iv) protection against default in payment by debtors and (c) notice of assignment of the receivables is to be given to debtors”. The agreement between the suppliers and the factor specifies the factoring procedure.

Factoring Services

While purchase of receivables is the fundamental to the functioning of factoring, the factor provides the following three basic services to the clients :

- Sales ledger administration and credit management;
- Credit collection and protection against default and bad debt losses and
- Financial accommodation against the assigned receivables.

Types of Factoring

The factoring facilities available worldwide can be broadly classified into the following four main groups :

- Full service non-recourse (old line)
- Full service recourse factoring
- Agency factoring and
- Non-notification factoring.

Full service non-recourse : Under this method accounts receivables are purchased by the factors, assuming 100 percent credit risk.

Full service recourse factoring : In this method, the client is not protected against the risk of bad debts. He has no indemnity against uncollected debts.

Agency factoring : Under this method, the factor finances the bad debts against agency either on recourse or without recourse.

Non-notification factoring : In this type, customers are not informed about the factoring agreement. The factor performs all his usual functions without a disclosure to customers that he owns the book debts

Costs and Benefits of Factoring

There are two types of costs involved in factoring. These are discussed below :

Factoring Commission or Service Fee : This cost is paid for credit evaluation and collection and other services and to cover bad debt losses. In reality, factoring commission depends upon the total volume of receivables, the size of individual receivables and the quality of receivables. The commission is expected to be higher in case of without recourse factoring since the factor assumes the entire credit risk.

Interest on Advance Granted by the Factor : The interest on advance would be higher than the prevailing prime rate of interest or the bank overdraft rate. In the opinion of the experts, the factor should not charge more than what the banks are charging since they would be in competition with the banks as regards financing of receivables.

Benefit of Factoring Factoring provides the following benefits :

- (i) It give specialized services in credit management and thus helps the firm's management to concentrate on manufacturing and marketing.
- (ii) It helps the firm to save the credit administration due to the scale of economics and specialization.

Problems and Solutions

Problem - 1

One factor will purchase accounts receivables of Micro World Corporation worth Tk. 1,00,000. The factor would pay in advance equal to 70% of the receivables @8 interest. The factor would charge a fee @ 2% on all purchased accounts receivables. Such factoring would save Tk.1,500 per month as bad debts. The peiod of payments as debtors is 60 days.

Determine the cost of factoring.

Solution

Advance paid = Tk. (70% of Tk. 1,00,000) = Tk. 70,000

Interest payable on advanced amount = $70,000 \times \frac{8}{100} \times \frac{2}{12}$

= 933 (Approx.)

Monthly Interest = $933/2$ = Tk. 466.50

Commission payable = $1,00,000 \times \frac{2}{100}$ = 2,000

Financing cost of accounts receivable per month

= $2,000 + 466.50$ = 2,466.50 less cost savings Tk. 1,500

Hence, net cost of financing = 966.50

Hence, effective rate of interest = $\frac{966.50}{70,000} \times 12 \times 100 = 16.57\%$

Problem - 2

A firm is thinking about stringent collection policy. The following details are available :

- (a) At present the firm is selling 36,000 units on credit at a price of Tk. 32 each; the variable cost per unit is Tk. 25 while the average cost per unit is Tk. 29; average collection period is 58 days; collection expenses amount to Tk. 10,000 and bad debts are 3%.
- (b) If the collection procedures are tightened, additional collection charges of Tk. 20,000 would be required; bad debts will be 1%; the collection period will be 40 days and sales volume is likely to decline by 500 units.

Assuming a 20% ROI, what would be your recommendation ? Should the firm implement the decision ?

Solution

The decision to implement the new strategy of tightening the collection policy should be based on the cost benefit analysis. The benefits are from reduced bad debt expenses and average collection period. On the contrary, the costs of implementing the decision are : (i) decrease in sales volume and (ii) additional collection charges. All these calculations are shown below :

(i) **Bad debt expenses :**

Present plan : 3% of Tk. 11,52,000 =	Tk. 34,560
Proposed plan : 1% of Tk. 11,36,000=	<u>Tk. 11,360</u>
Saving in bad debt expenses =	<u>Tk. 23,200</u>

(ii) **Average collection period/average investment in receivables :**

$$\text{Average investment} = \frac{\text{Cost of sales}}{\text{Receivables turnover}}$$

$$\text{Present plan} = \frac{36,000 \times \text{Tk.} 29}{360 / 58} = \text{Tk.} 1,68,200$$

$$\text{Proposed plan} = \frac{(36,000 \times \text{Tk.} 29) - (500 \times \text{Tk.} 26)}{360 / 40} = \text{Tk.} 1,14,611$$

Savings in average investments: Tk. 53,589

Assuming a 20% return, the firm will be able to earn Tk. 10,718 on this saving

(iii) **Sales volume :**

Since the sales volume will decline by 500 units, there would be a loss of Tk. 3,500 (500 x Tk. 7).

(iv) **Collection charges:**

Additional expenditure would be Tk. 20,000.

Thus, the total benefits from a tightening of the collection policy will be Tk. 33,918 (Tk. 23,200 + 10,718) and the total cost will be Tk. 23,500 (Tk. 3,500 + 20,000). Therefore, there would be a net gain of Tk. 10,418 (Tk. 33,918 – Tk. 23,500). The firm should, therefore, implement the proposed strategy.

Problem - 3

XYZ Corporation is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. Currently the firm has annual credit sales of Tk. 50,00,000 and accounts receivable turnover ratio of 4 times a year. The current level of loss due to bad debts is Tk. 1,50,000. The firm is required to give a return of 25% on the investment in new accounts receivable. The company’s variable costs are 70% of the selling price. Given the following information, which is a better option ?

	Present policy	Policy option I	Policy option II
Annual credit sales	Tk. 50,00,000	Tk. 60,00,000	Tk. 67,50,000
Accounts receivable turnover ratio	4 times	3 times	2.4 times
Bad debt losses	Tk. 1,50,000	Tk. 3,00,000	4,50,000

Solution

XYZ Corporation

Decision –making (liberalization of credit terms, selecting Policy option I or Policy II)

	Present policy (Tk.)	Policy option I (Tk.)	Policy option II (Tk.)
Sales revenue	50,00,000	60,00,000	67,50,000
Less variable cost (70%)	(35,00,000)	(42,00,000)	47,25,000
Contribution margin (manufacturing)	15,00,000	18,00,000	20,25,000
Less other relevant costs :			
Bad debt losses	(1,50,000)	(3,00,000)	4,50,000
Investment cost (see working notes)	2,18,750	(3,50,000)	4,92,187.50
Contribution margin (final)	11,31,250	11,50,000	10,82,812.50

Comment :

The firm is advised to adopt policy option I (extend credit term to 4 months) since the firm’s contribution margin is the maximum at this policy option.

Working Notes :

- (i) Calculation of investment cost at present policy = Tk. 35,00,000/4 times = Tk. 8,75,000. Therefore, its cost is 25% of Tk. 8,75,000 = Tk. 2,18, 750.
- (ii) Calculation of investment cost at policy option I = Tk. 42,00,000/3 times = Tk. 14,00,000, its cost is 25% of 14,00,000 = Tk. 3,50,000.
- (iii) Calculation of investment cost at policy option II = Tk. 47,25,000/2.4 times = Tk. 19,68,750, its cost is 25% of 19,68,750 = 4,92,187.50.

In the above cases in absence of total costs, investment cost is determined with reference to variable costs only.

Review Questions

Short Questions

1. What do you mean by accounts receivables and accounts receivables management ?
2. What is the basic objective of account receivable management ?
3. Explain the specific costs and benefits relevant to the determination of accounts receivables policy.
4. What are the goals of a credit policy ?
5. What is a credit policy ? What are its elements ?
6. What is an optimum credit policy ?
7. Examine the role of cost benefit analysis in the formulation of an optimum credit policy.
8. What is a credit period ?
9. What is cash discount ? Give an example.
10. What is credit collection policy ?
11. What is credit analysis ? Explain.

Broad Questions

12. Explain the major credit policy variables.
13. What are the basic factors considered in evaluating a credit policy of a firm ? Explain.
14. What is meant by monitoring of accounts receivables ? Explain its main methods.
15. What is factoring ? Discuss its nature. Examine the cost and benefit involved in factoring.

Review Problems

Problem - 1

A small firm has a total credit sales of Tk. 80,00,000 and its average collection period is 80 days . The past experience indicates that bad-debt losses are around 1 percent of credit sales. The firm spends about Tk. 1,20,000 per annum on administering its credit sales. This cost includes salaries of one officer and two clerks who handle credit checking, collection etc., telephone and telex charges. These are avoidable costs. A factor is prepared to buy the firm' receivables. He will charge 2 percent commission. He also pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve. What should the firm do ?

Problem - 2

The Hypothetical Ltd. has currently annual credit sales of Tk. 7,80,000. Its average age of accounts receivable is 60 days.

It is contemplating a change in its credit policy that is expected to increase sales to Tk. 10,00,000 and increase the average age of accounts receivable to 72 days.

The firm's sales price is Tk. 25 per unit, the variable cost per unit is Tk. 12 and the average cost per unit at Tk. 7,80,000 sales volume is Tk. 17. Assume a 360-day year.

- (i) What is the average accounts receivable with both the present and the proposed plans ?
- (ii) What is the average cost per unit with the proposed plan ?
- (iii) Calculate the marginal investments in accounts receivable resulting from the proposed change.
- (iv) What is the cost of marginal investment if the assumed rate of return is 15%.

Problem - 3

Durham-Feltz Corporation presently gives terms of net 30 days. It has \$ 60 million in sales, and its average collection period is 45 days. To stimulate demand, the company may give terms of net 60 days. If it does instigate these terms, sales are expected to increase by 15 percent. After the change, the average collection period is expected to be 75 days, with no difference in payment habits between old and new customers. Variable costs are \$.80 for every \$1.00 of sales, and the company's required rate of return on investment in receivables is 20 percent. Should the company extend its credit period ? (Assume a 360-day year).

Case Study

The Boca Grande Company expects to have sales of \$10 million this year under its current operating policies. Its variable costs as a percentage of sales are 80 percent, and its costs short-term funds is 16 percent. Currently, Boca Grande's credit policy is net 25 (no discount for early payment). However, its DSO is 30 days, and its bad debt loss percentage is two percent. Boca Grande spends \$50,000 per year to collect bad debts, and its marginal tax rate is 40 percent.

The credit manager is considering two alternative proposals for changing Boca Grande's credit policy. Find the expected change in net income, taking into consideration anticipated changes in carrying costs for accounts receivable, the probable bad debt losses, and the discounts likely to be taken, for each proposal. Should a change in credit policy be made ?

Proposal 1 : Lengthen the credit period by going from net 25 to net 30. Collection expenditures will remain constant. Under this proposal, sales are expected to increase by \$1 million annually, and the bad debt loss percent on all sales is expected to rise to three percent. In addition, the DSO is expected to increase from 30 to 45 days on all sales.

Proposals 2 : Shorten the credit period by going from net 25 to 20. Again, collection expenses will remain constant. The anticipated effects of this change are a decrease in sales of \$1 million per year, a decline in the DSO from 30 to 22 days, and a decline in the bad debt loss percentage to one percent on all sales

Lesson–9: Marketable Securities Management

After attentively reading the lesson 9, you should be able-

- To grasp the meaning and characteristics of marketable securities and the reasons for owning them.
- To know about the types of marketable securities.
- To identify the factors considered while making investment in marketable securities; and.
- To get the idea of portfolio management relating to investment in marketable securities.

Meaning and Characteristics of Marketable Securities

Meaning and Characteristics

Securities those can be sold on short notice without loss of principal or original investment called are market also securities. 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 a few days. The basic characteristics of marketable securities affect the degree of their marketability/ liquidity. To be liquid, a security must have two basic characteristics: a ready market and safety of principal. Ready marketability minimizes the amount of time required to convert a security into cash. A ready market should have both breadth 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.

Securities those can be sold on short notice without loss of principal or original investment called are market also securities

Ready marketability minimizes the amount of time required to convert a security into cash.

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 securities 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 alternatives were to risk a significant reduction in principal.

A wide variety of securities is available to firms that choose to hold marketable securities. But the characteristics generally associated with marketable securities are as follows :

1. **Maturity.** Firms hold marketable securities in order to temporarily invest cash that otherwise would be idle in the short run. Therefore, marketable securities are short-term investments, often they are held only for a few days or weeks. If the cash budget indicates the funds are not needed in the foreseeable future, then long-term investments, which generally earn higher returns, should be used.

2. **Risk.** Recall that earlier we developed this equation for determining the nominal interest rate :

$$k_{\text{Nom}} = k^* + \text{IP} + \text{DRP} + \text{LP} + \text{MRP}$$

Here k^* is the real risk-free rate, IP is a premium for expected inflation, DRP is the default risk premium, LP is the liquidity (or marketability) risk premium, and MRP is the maturity (or interest rate) risk premium. Also, remember from earlier Lesson that the risk-free rate k_{RF} , is equal to $k^* + \text{IP}$, and a Government Treasury bill comes closest to the risk-free rate. For other instruments considered appropriate as marketable securities, the default and liquidity risks are small, and the interest-rate risk is negotiable. These risks are small because marketable securities mature in the short-term, and the short run is less uncertain than the long run. In general, then, the total risk associated with a portfolio of marketable securities (short-term) is less than the total risk associated with a portfolio of long-term investments.

3. **Liquidity** We generally judge an asset's marketability according to how quickly and easily it can be bought and sold in the financial markets. If an asset can be sold on short notice for close to its original purchase price, it is to be liquid. Because marketable securities are held as a substitute for cash and as a temporary investment, such instruments should be very liquid.
4. **Return (yield)** Because the marketable securities portfolio generally is composed of highly liquid, short-term securities with low risks, the returns associated with such investments are relatively low when compared to other investments. But given the purpose of the marketable securities portfolio, treasurers should not sacrifice safety for higher rates of return.

Rationale for Owning Marketable Securities

Marketable securities, or near-cash assets, are extremely liquid, short-term investments that permit the firm to earn positive returns on cash that is not needed to pay bills immediately but will be needed sometime in the near term, perhaps in a few days, weeks, or months. Although such investments typically yield much lower yields than operating assets, nearly every large firm has possessed them. The following are the two main reasons for owning marketable securities of the firm :

- i. Marketable securities serve as a substitute for cash balances. Firms often hold portfolios of marketable securities, liquidating part of the portfolio to increase the cash account when cash is needed because the marketable securities offer a place temporarily put cash balances to work earning a positive return. In such situations, the marketable securities could be used as a substitute for transactions balances, for precautionary balances, for speculative balances, or for all three.
- ii. Marketable securities are also used as a temporary investment :
(a) to finance seasonal or cyclical operations and (b) to amass

funds to meet financial requirements in the near future. For example, if the firm has a conservative financing policy, then its long-term capital will exceed its permanent assets, and marketable securities will be held when inventories and receivables are low.

Types of Marketable Securities

In this section, we describe briefly the more prominent marketable/near-cash securities available for investment. Our concern is with money market instruments.

Treasury Bills : These are obligations of the government. They are sold on a discount basis. The investor does not receive an actual interest payment. The return is the difference between the purchase price and the face (par) value of the bill. The treasury bills are issued only in bearer form. They are purchased, therefore, without the investors' name upon them. This attribute makes them easily transferable from one investor to another. A very active secondary market exists for these bills. The secondary market for bills not only makes them highly liquid but also allows purchase of bills with very short maturities.

These are obligations of the government. They are sold on a discount basis.

Negotiable Certificates of Deposit (CDs) : 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 interest. The denomination and maturities are tailored to the investors' need. The CDs are offered by banks on a basis different from treasury bills, that is, they are not sold at a discount. Rather, when the certificates mature, the owner receives the full amount deposited plus the earned interest. A secondary market exists for the CDs.

These are marketable receipts for funds that have been deposited in a bank for a fixed period of time.

Commercial Paper : It refers to short-term unsecured promissory note sold by large business firms to raise cash. As they 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. Companies with high credit rating can sell directly to investors. The denominations in which they can be bought vary over a wide range. They can be purchased similarly with varying maturities. 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. For all practical purposes, there is no active trading secondary market for commercial paper although direct sellers of CPs often repurchase it on request.

It refers to short-term unsecured promissory note sold by large business firms to raise cash.

Bankers' 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. They 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 acceptances are used to finance the acquisition of goods by one party, the document

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.

is not 'issued' in specialized denominations; its size/ denomination is determined by the cost of goods being purchased. They serve a wide range of maturities and are sold on a discount basis, payable to the bearer. A secondary market for the acceptances of large banks does exist.

These are legal contracts that involve the actual sale of securities by a borrower to the lender.

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 charge. 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 why a firm with excess cash prefers to buy repurchase agreements rather than a marketable security. First, 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. Closely related to the first is the second reason, namely, 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 fluctuations throughout the contract period. This makes it a sound alternative investment for funds that are surplus for only short periods.

Units The units of the Mutual Trust or Unit Trust offer a reasonably convenient alternative avenue for investing surplus liquidity as (i) there is a very active secondary market for them, (ii) the income from units is tax-exempt up to a specified amount and, (iii) the units appreciate in a fairly predictable manner.

Inter-corporate Deposits Inter-corporate deposits, that is, short-term deposits with other companies are a fairly attractive form of investment of short-term funds in terms of rate of return. However, apart from the fact that one month's time is required to convert them into cash, inter-corporate deposits suffer from high degree of risk.

Surplus funds may be deployed to purchase/ discount bills.

Bills 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. 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 inter-corporate deposits for investing surplus funds. While parking 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, they should be backed by letter of credit /acceptance by banks to ensure absolute safety of funds.

It enables corporate firms to utilize their float money gainfully.

Call Market It deals with funds borrowed/lent overnight one-day (call) money and notice money for periods up to 14 days. It enables corporate firms to utilize 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 fulfill their CRR requirements pushes up the rates and a sharp decline takes place once these funds are met.

Eurodollars Although most Eurodollars are deposited in Europe, the term applies to any dollar deposit in foreign banks or in foreign branches of U.S. banks. There exists a substantial, very active market for the deposit and lending of Eurodollars. This market is a wholesale one in that the amounts involved are at least \$100,000. Moreover, the market is free of government regulation, as it is truly international in scope. As a marketable security, the Eurodollar time deposit is like a negotiable certificate of deposit. Most deposits have a maturity of less than a year, and they can be sold in the market prior to maturity.

Short-Term Municipal Securities State and local governments are increasingly providing securities tailored to the short-term investor. One is a commercial paper type of instrument, where the interest rate is reset every week. That is, the security is essentially a floating rate where the weekly reset ensures that market value will vary scarcely at all. Some corporations invest in longer-term municipal securities, but the maturity usually is kept within 1 or 2 years. A problem with longer-term instruments is that marketability is only fair. Shorter-term instruments designed for the corporate treasurer and for municipal money market mutual funds have much better marketability and price stability.

Factors Influencing Investment in Marketable Securities

A major decision confronting the financial managers involves the determination of the mix of cash and marketable securities.

In general, the choice of the mix is based on a trade-off between the opportunity to earn a return on idle funds (cash) during the holding period, and the brokerage costs associated with the purchase and sale of marketable securities.

The choice of the mix is based on a trade-off between the opportunity to earn a return on idle funds (cash).

This trade-off between interest returns and brokerage costs is a key factor in determining what 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 and 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. The type of marketable security 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 (ii) interest rate risk (iii) taxability (iv) liquidity and (v) yield among different financial assets.

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 (low), then the financial risk is said to be high (low). 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 makeup of the portfolio.

Interest Rate Risk The uncertainty that is associated with the expected returns 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, terms to maturity.

If prevailing interest rate's rise is compared with the date of purchase, the market price of the securities will fall to bring their yield to maturity in line with what financial managers could obtain by buying a new issue of a given instrument, for instance, treasury bills. The longer the maturity of the instrument, the larger will be the 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.

Taxability Another factor affecting observed difference in market yields is the differential impact of taxes. Securities, income on which is 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, their yield to maturity tends to be lower than the yield on comparable securities with higher coupon rates. The greater the discount, the greater is the capital gains attraction and the lower is its yield relative to what it would be if the coupon rate were such that the security was sold at par.

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 portion 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) the time period needed to sell the security and (ii) the likelihood that the security can be sold at or near its prevailing market price.

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, financial risk, interest rate risk, liquidity and taxability; 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. In brief, the finance manager must focus on the risk-return trade-off 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.

Investment of Portfolio Management (PM)

Portfolio Management (PM)

The decision to invest excess cash in marketable securities involves not only the amount to invest but also the type of security in which to invest. To some extent, the two decisions are interdependent. Both should be based on an evaluation of expected net cash flows and the uncertainty associated with these cash flows. If future cash-flow patterns are known with reasonable certainty and the yield curve is upward sloping in the sense of longer-term securities yielding more than shorter-term ones, a company may wish to arrange its portfolio so that securities will mature approximately when the funds will be needed. Such a cash-flow pattern gives the firm a great deal of flexibility in maximizing the average return on the entire portfolio, for it is unlikely that significant amounts of securities will have to be sold unexpectedly.

If the yield curve is downward sloping, the maturity matching strategy outlined above may not be appropriate. The company may wish to invest in securities having maturities shorter than the intended holding period, then to reinvest at maturity. In this way, it can avail itself of the higher initial yield on shorter-term securities, but it does not know what the securities will yield on reinvestment at maturity. Another key factor is the degree of certainty one has in the cash-flow projections. With a high degree of certainty, the maturity of a marketable security becomes its most important characteristic. If future cash flows are fairly uncertain, the most important characteristics of a security become its marketability and risk with respect to fluctuations in market value. Treasury bills and short-term repos are perhaps best suited for the emergency liquidity needs of a firm. Higher yields can be achieved by investing in longer-term, less marketable securities with greater risk.

Amount of investment & types of securities should be based on an evaluation of expected net cash flows and the uncertainty associated with these cash flows.

Review Questions:

A. Short questions:

1. Define marketable securities. Examine their main features.
2. Why do investors prefer marketable securities?
3. What is portfolio management relating to marketable securities?
4. How higher yields can be achieved from investment in marketable securities? Examine.
5. How does taxability affect selection of marketable securities?
6. How does return/yield affect selection of marketable securities?
7. Write short notes on:
(a) Treasury bills; (b) Commercial paper; (c) Bankers acceptance and (d) Bills discounting.
8. What is a repurchase agreement? Why do the firms with excess cash prefer to the repurchase agreements?
9. What are the motives for maintaining liquidity in the form of marketable securities?

B. Broad questions

10. Discuss briefly the various types of marketable securities.
11. Describe the considerations that help the firms selecting a proper marketable securities mix.

Lesson–10: Short term Financing

After careful reading of the lesson 10, you should be able-

- To realize the concepts and necessity of short term financing and selection of its sources.
- To know the mode and procedures involved in short-term financing and.
- To determine the costs involved in trade and bank credits.

Concepts and Necessity of Short term Financing

The need for short-term financing arises mainly because the investment in working capital/current assets, that is, raw materials, work/stock-in-process, finished goods and receivables typically fluctuates during the year. Although long-term funds partly finance current assets and provide the margin money for working capital, such assets/working capitals are virtually exclusively supported by short-term sources. The necessity for financing working capital also arises to maintain the liquidity and short-term solvency of a firm. Lenders, suppliers and creditors expect prompt payments of their dues. This requires the solvency of a firm on a continuous basis. Again, the sources of financing working capital play a vital role in maintaining liquidity and profitability of the firm. If permanent working capital is financed by short-term loans, the business will face lack of liquid assets when the loan falls due. It will cause interruption in the normal business operation. On the other hand, if temporary working capital is financed by long term finance, the amount will remain idle after the need for such capital is over; this causes loss to the firm to the extent of cost of capital. Therefore, it is also expected that an organization is to select appropriate source for financing the working capital.

It is also expected that an organization is to select appropriate source for financing the working capital.

Major Sources of Short term Financing.

The main sources of short term financing are: (i) trade credit; (ii) bank credit; (iii) accruals; (iv) commercial paper and (v) factoring. The following sub-sections deal with each of the sources.

Trade Credit

Features

Trade credit refers to the credit extended by the supplier of goods and services in the normal course of transaction/business/sale of the firm. According to trade practices, cash is not paid immediately for purchases but after an agreed period of time. Thus, deferral of payment (trade credit) represents a source of finance for credit purchases. There is, however, no formal/specific negotiation for trade credit. It is an informal arrangement between the buyer and the seller. There are no legal instruments/ acknowledgements of debt, which are granted on an open

Trade credit refers to the credit extended by the supplier of goods and services in the normal course of transaction/business /sale of the firm.

account basis. Such credit appears in the records of the buyer of goods as sundry creditors/accounts payable.

There are two components of trade credit namely free and costly.

Free trade credit Credit received during the discount period.

Costly trade credit Credit taken in excess of “free” trade credit, whose cost is equal to the discount lost.

Costs of Trade Credit

There is an implicit cost of trade credit. It depends on the credit terms offered by the supplier of goods.

Trade credit does not involve any explicit interest charge. However, there is an implicit cost of trade credit. It depends on the credit terms offered by the supplier of goods. If the terms of the credit are, say, 45 days net, the payable amount to the supplier of goods is the same whether paid on the date of purchase or on the 45th day and, therefore, trade credit has no cost, that is, it is cost-free. But if the credit terms are, say, 2/15, net 45, that is, there is discount for prompt payment, the trade credit beyond the discount period has a cost equals to : [(Discount/1 – Discount) × (360 days/Credit period - Discount period)]. Alternatively, the credit terms, 2/15, net 45, imply that the firm (buyer) is entitled to 2 percent discount for payment made within 15 days when the entire payment is to be made within 45 days.

To sum up, as the cost of trade credit is generally very high beyond the discount period, firms should avail of the discount on prompt payment. If, however, they are unable to avail of discount, the payment of trade credit should be delayed till the last day of the credit (net) period and beyond without impairing their credit-worthiness. But, a precondition for obtaining trade credit particularly by a new company is cultivating good relationship with suppliers of goods and obtaining their confidence by honoring commitments.

The following equation can be used to calculate the approximate percentage cost, on an annual basis, of not taking cash discounts – that is, the cost of forgoing discounts.

Approximate Cost of forgoing a Cash Discount (%) =

$$\frac{\text{Discount Percent}}{100 - (\text{Discount Percent})} \times \frac{360 \text{ days}}{\text{Total days Net credit is available} - \text{Discount Period}}$$

Bank Credit

Bank credit is the primary institutional source of working capital finance in Bangladesh. In fact, it represents the most important source for financing of current assets. Working capital finance is provided by banks in five ways: (i) cash credits/overdrafts, (ii) loans, (iii) purchase/ discount bills, (iv) letter of credit and (v) working capital term loans.

Cash Credits/Overdrafts : Under cash credit/overdraft form/arrangement of bank finance, the bank specifies a predetermined borrowing/credit limit. The borrower can draw/borrow up to the stipulated credit/ overdraft limit. Within the specified limit, any numbers of drawls/drawings are possible to the extent of his requirements periodically. Similarly, repayments can be made whenever desired during the period. The interest is determined on the basis of the running balance/amount actually utilized by the borrower and not on the sanctioned limit.

Under cash credit/overdraft form/ arrangement of bank finance, the bank specifies a predetermined borrowing/ credit limit.

Loans : Under this arrangement, the entire amount of borrowing is credited to the current account of the borrower or released in cash. The borrower has to pay interest on the total amount. The loans are repayable on demand or in periodic instalments. They can also be renewed from time to time. As a form of financing, loans imply a financial discipline on the part of the borrower.

Under this arrangement, the entire amount of borrowing is credited to the current account of the borrower or released in cash.

Bills Purchased/Discounted This arrangement is of relatively recent origin in Bangladesh. Under this arrangement, bank credit is being made available through discounting of usance bills by banks. The amount made available under this arrangement is covered by the cash credit and overdraft limit. Before discounting the bill, the bank satisfies itself about the credit-worthiness of the drawer and the genuineness of the bill. To popularize the scheme, the discount rates are fixed at lower rates than those of cash credit.

The amount made available under this arrangement is covered by the cash credit and overdraft limit.

The modus operandi of bill finance as a source of working capital financing is that a bill arises out of a trade sale-purchase transaction on credit. The seller of goods draws the bill on the purchaser of goods, payable on demand or after a usance period not exceeding 90 days. On acceptance of the bill by the purchaser, the seller offers it to the bank for discount/purchase. On discounting the bill, the bank releases the funds to the seller. The bill is presented by the bank to the purchaser/acceptor of the bill on due date for payment the bills can also be rediscounted with the other banks. However, this form of financing is not very popular in the country.

Term Loans for Working Capital Under this arrangement, banks advance loans for 3-7 years repayable in yearly or half-yearly instalments.

Letter of Credit While the other forms of bank credit are direct forms of financing in which banks provide funds as well as bear risk, letter of credit is an indirect form of working capital financing and banks assume only the risk, the credit being provided by the supplier himself.

The purchaser of goods on credit obtains a letter of credit from a bank.

The purchaser of goods on credit obtains a letter of credit from a bank. The bank undertakes the responsibility to make payment to the supplier in case the buyer fails to meet his obligations. Thus, the modus operandi of letter of credit is that the supplier sells goods on credit/extends credit (finance) to the purchaser and the bank gives a guarantee and bears risk only in case of default by the purchase.

Cost of Bank Credit

Prime Rate

A published rate of interest charged by banks to short-term borrowers (usually large, financially secured corporations) with the best credit; rates on short-term loans generally are “pegged” to the prime rate.

A published rate of interest charged by banks to short-term borrowers (usually large, financially secured corporations) with the best credit; rates on short-term loans generally are “pegged” to the prime rate. The cost of bank loans varies for different types of borrowers at any given point in time and for all borrowers over time. Interest rates are higher for riskier borrowers and rates also are higher on smaller loans because of the fixed costs involved in making and servicing loans. If a firm can qualify as a “prime credit” because of its size and financial strength, it might be able to borrow at the prime rate, which traditionally has been the lowest rate banks charge. Rates on other loans generally are scaled up from the prime rate.

Interest paid on a bank loan generally is calculated in one of three ways: (1) simple interest (2) discount interest; and (3) add-on interest. These three approaches are explained in the following sections.

Computing the Annual Cost (Rate) of Bank Loans

Before we describe the specific feature of each of the three approaches to computing the interest paid on bank loans, it will be useful to briefly discuss how the effective annual rate of return (percent cost) and the annual percentage rate (APR) are calculated.

For any types of short-term credit, we can compute the interest rate for the period the funds are used with the following equation.

$$\text{Interest rate per period (cost)} = \frac{\text{Dollar Taka cost of borrowing}}{\text{Amount of usable funds}}$$

We can compute the effective annual rate and the annual percentage rate (APR) using the following formula :

$$\text{Effective annual rate} = \text{EAR} = (1 + \text{Interest rate per period})^m - 1.0$$

$$\text{Annual percentage rate} = \text{APR} = (\text{Interest rate per period}) \times m$$

Where m is the number of borrowing periods in one year (i.e., if the loan is for one month, $m = 12$).

Simple Interest Loan

Both the amount borrowed and the interest charged on that amount are paid at the maturity of the loan; there are no payments made before maturity.

Face value The amount of the loan or the amount borrowed; also called the principal amount of the loan.

Discount Interest Loan: A loan in which the interest, which is calculated on the amount borrowed, is paid at the beginning of the loan period; interest is paid in advance.

Add-on Interest: Interest that is calculated and then added to the amount borrowed to obtain the total dollar amount to be paid back in equal installments.

Accruals

Accruals refer to continually recruiting short-term liabilities, liabilities such as wages and taxes that increase spontaneously with operations. Firms generally pay employees on a weekly, biweekly, or monthly basis, so the balance sheet typically will show some accrued wages. Similarly, the firm's own estimated income taxes, the social, the social security and income taxes withheld from employee payrolls, and the sales taxes collected generally are paid on a weekly, monthly, or quarterly basis, so that balance sheet typically will show some accrued taxes along with accrued wages.

Accruals increase automatically or spontaneously, as a firm's operations expand. Further, this type of debt generally is considered "free" in the sense that no explicit interest is paid on funds raised through accruals. However, a firm ordinarily cannot control its accruals. The timing of wage payments is set by economic forces and industry custom, while tax payment dates are established by law. Thus, firms use all the accruals they can, but they have little control over the levels of these accounts.

Commercial Paper :

Commercial paper (CP) is a short-term unsecured negotiable instrument, consisting of usance promissory notes with a fixed maturity. It is issued on a discount on face value basis but it can also be issued in interest-bearing form. A CP when issued by a company directly to the investor is called a direct paper. The companies announce current rates of CPs of various maturities and investors can select those maturities which closely approximate their holding period. When CPs are issued by security dealers/dealers on behalf of their corporate customers, they are called dealer paper. They buy at a price less than the commission and sell at the highest possible level. The maturities of CPs can be tailored within the range to specific investments.

Commercial paper (CP) is a short-term unsecured negotiable instrument, consisting of usance promissory notes with a fixed maturity.

As the CPs are issued at discount and redeemed at it face value, their effective pre-tax cost/interest yield

$$= \left(\frac{\text{Face value} - \text{Net amount realised}}{\text{Net amount realised}} \right) \times \left(\frac{360}{\text{Maturity period}} \right)$$

Where net amount realized = Face value – discount – issuing and paying agent (IPA) charges, that is, stamp duty, rating charges, dealing bank fee and fee for stand by facility.

Factoring

Factoring provides resources to finance receivables as well as facilitates the collection of receivables. Although such services constitute a critical segment of the financial services scenario in the developed countries; but in our country factoring is quite new.

Definition Factoring can broadly be defined as an agreement in which receivables arising out of sale of goods/services are sold by a firm (client) to the factor (a financial intermediary) as a result of which the title of the goods/services represented by the said receivables passes on to the fact the factor.

Once a sale transaction is completed the factor steps in to realize the sales.

Mechanism Credit sales generate the factoring business in the ordinary course of business dealings. Realization of credit sales is the main function of factoring services. Once a sale transaction is completed the factor steps in to realize the sales. Thus, the factor works between the seller and the buyer and sometimes with the seller's banks together.

Functions of a Factor

Depending on the type/form of factoring the main functions of a factor in general terms can be classified into five categories;

- Financing facility/trade debts;
- Maintenance/administration of sales ledger;
- Collection facility/of accounts receivable;
- Assumption of credit risk/credit control and credit restriction and
- Provision of advisory services

The rights of the lending bank (hypothecate) depend upon the terms of the contract between the borrower and the lender.

Modes of Security

Banks provide credit on the basis of the following modes of security :

Hypothecation : Under this mode of security, the banks provide credit to borrowers against the security of movable property, usually inventory of goods. The goods hypothecated, however, continue to be in the possession of the owner of these goods (i.e., the borrower). The rights of the lending bank (hypothecate) depend upon the terms of the contract between the borrower and the lender.

The term 'lien' refers to the right of a party to retain goods belonging to another party until a debt due to him is paid.

Pledge : Pledge as a mode of security is different from hypothecation in that in the former unlike in the latter, the goods which are offered as security are transferred to the physical possession of the lender. An essential prerequisite of pledge, therefore, is that the goods are in the custody of the bank.

Lien : The term 'lien' refers to the right of a party to retain goods belonging to another party until a debt due to him is paid. Lien can be of two types (i) particular lien and (ii) general lien Particular lien is a right to retain goods until a claim pertaining to these goods is fully paid. On the other general lien can be applied till all dues of the claimant are paid. Banks usually enjoy general lien.

Mortgage : It is the transfer of a legal/equitable interest in specific immovable property for securing the payment of debt. The person who parts with the interest in the property is called 'mortgagor' and the bank in whose favor the transfer takes place is the 'mortgagee. The mortgage interest in the property is terminated as soon as the debt is paid. Mortgages are taken as an additional security for working capital credit by banks.

It is the transfer of a legal/equitable interest in specific immovable property for securing the payment of debt.

Charge : Where immovable property of one person is, by the act of parties or by the operation of law, made security for the payment of money to another and the transaction does not amount to mortgage, the latter person is said to have a charge on the property and all the provisions of simple mortgage will apply to such a charge.

Secured Loan : It refers to a loan backed by collateral; for short-term loans the collateral often is inventory, receivables, or both. So far we have not addressed the question of whether loans should be secured or not. Commercial paper is never secured, but all other types of loans can be secured if this is deemed necessary or desirable. Given a choice, it ordinarily is better to borrow on an unsecured basis because the bookkeeping costs of secured loans often are high. However, weak firms might find that they can borrow only if they put up some type of security or that by using security they can borrow at a lower rate.

Uniform Commercial Code : It refers to a system of standards that simplifies procedure for establishing loan security.

Accounts Receivable Financing : Pledging Receivables using accounts receivable as collateral for a loan. Accounts receivable financing involves either the pledging of receivables or the selling of receivables (called factoring). The pledging of accounts receivable is characterized by the fact that the lender not only has a claim against the receivables but also has recourse to the borrower.

Recourse : Under this, the lender can seek payment from the borrowing firm when receivables' accounts used to secure a loan are uncollectible.

Problems and Solution

Problem - 1

Gallinger corporation projects an increase in sales from \$ 1.5 million to \$2 million, but it needs an additional \$300,000 of current assets to support this expansion. The money can be obtained from the bank at an interest rate of 13 percent, discount interest; no compensating balance is required. Alternatively Gallinger can finance the expansion by no longer taking discounts, thus increasing accounts payable. Galliger purchases under terms of 2/10, net 30, but it can delay payment for an additional 35 days paying in 65 days and thus becoming 35 days past due- without a penalty because of its suppliers' current excess capacity problems.

- Based strictly on effective annual interest rate comparisons, how should Gallinger finance its expansion.
- What additional qualitative factors should Gallinger consider before reaching a decision ?

Solution

a. Commercial bank loan		
Amount loaned	= (0.75) (\$250,000)	= \$187,500
Discount	=0.09/12) (\$187,500)	= (1,406)
Compensating balance	=0.20) (\$187,500)	= (37,500)
Amount received		= \$148,594
Interest expense	= (0.09) (\$187,500)	= \$ 16,875
Credit department*	= (\$4,000) (12)	= \$ 48,000
Bad debts*	=0.02) (\$250,000) (12)	= \$ 60,000
Total annual costs		= \$124,875.

*The costs of the credit department and bad debts are expenses that will be incurred if a bank loan is used, but these costs will be avoided if the firm accepts the factoring arrangement.

Factoring :		
Amount loaned	= (0.85)(\$ 250,000)	=\$212,500
Commission for period	=(0.035)(\$ 250,000)	=(8,750)
Prepaid interest	=(0.09/12)(\$ 203,750)	=(1,528)
Amount received		=\$202,222
Annual commission	=(8,750)(12)	=\$105,000
Annual interest	=(0.09)(\$ 203,750)	=18,338
Total annual costs		=123,338

- The factoring costs are slightly lower than the cost of the bank loan, and the factor is willing to advance significantly greater amount. On the other hand, the elimination of the credit department could reduce the firm's options in the future.

Problem – 2

Gifts Galore Inc. borrowed \$1.5 million from National City Bank (NCB). The loan was made at a simple annual interest rate of nine percent a year for three months. A 20 percent compensating balance requirement raised the effective interest rate because the company does not maintain a checking balance at NCB.

- a. The approximate interest rate (APR) on the loan was 11.25 percent. What was the true effective rate ?
- b. What would be the effective cost of the loan if the note required discount interest ?

Solution

Total amount of loan = \$ 15,00,000
 Interest 9% on \$ 15,00,000 = \$ 1,35,000
 Effective loan = Total loan – Compensating balance
 = \$ 15,00,000 – 20% of \$ 15,00,00
 = \$ 12,00,00

$$\begin{aligned} \text{Hence, true effective interest rate} &= \frac{\text{Total Interest}}{\text{Effective Loan}} \times 100 \\ &= \frac{1,35,000}{12,00,000} \times 100 \\ &= 11.25\% \end{aligned}$$

Problem – 3

Calculate the approximate cost of non-free trade credit under each of the following terms :

- (a) 1/15, net 20;
- (b) 2/10, net 60
- (c) 3/10, net 45
- (d) 2/10, net 45
- (e) 2/15, net 40

Solution

a) We know that approximate cost of foregoing cash discount (ie. Cost of non free trade credit)

$$\begin{aligned} &= \frac{\text{Discount \%}}{(100 - \text{Discount \%})} \times \frac{360}{(\text{Total days net payable} - \text{Discount period})} \\ &= \frac{1}{(100 - 1)} \times \frac{360}{20 - 15} \\ &= 7.27\% \end{aligned}$$

$$\text{b) Cost of non free trade credit} = \frac{2}{(100-2)} \times \frac{360}{(60-10)} = 14.69\%$$

c) Cost of non free trade credit

$$= \frac{3}{(100-3)} \times \frac{360}{(45-10)} = \frac{1080}{3395} = 3.18\%$$

d) Cost of non free trade credit

$$= \frac{2}{(100-2)} \times \frac{360}{(45-10)} = \frac{720}{3430} = 20.99\%$$

e) Cost of non free trade credit

$$= \frac{2}{(100-2)} \times \frac{360}{(40-15)} = \frac{720}{2450} = 29.39\%$$

Problem – 4

a) If a firm buys under terms of 3/15, net 45, but actually pays on the 20th day and still takes the discount, what is the approximate cost of its non-free trade credit ?

(b) Does it receive more or less credit than it would if it paid within 15 days ?

Solution

a) Approximate cost of non free trade credit

$$\begin{aligned} &= \frac{\text{Discount \%}}{(100 - \text{Discount \%})} \times \frac{360}{(\text{Total days net payable} - \text{Discount period})} \\ &= \frac{3}{(100 - 3)} \times \frac{360}{(45 - 20)} = \frac{3}{97} \times \frac{360}{25} \\ &= \frac{1080}{2425} = 44.54\% \end{aligned}$$

b) Yes, it would receive more or less credit; because in this situation -

Approx cost of non free trade credit

$$= \frac{3}{(100-3)} \times \frac{360}{(45-15)} = \frac{1080}{2910} = 37.11\%$$

Problem – 5

Susan Visscher, owner of Visscher’s Hardware, is negotiating with First Merchant’s Bank for a \$50,000, one-year loan, first Merchant’s has offered Visscher the following alternatives. Calculate the effective interest rate for each alternative. Which alternative has the lowest effective interest rate?

- (A) A 12 percent annual rate on a simple interest loan with no compensating balance required and interest due at the end of the year.
- (B) A nine percent annual rate on a simple interest loan with a 20 percent compensating balance required and interest against due at the end of the year.
- (C) An 8.75 percent annual rate on a discounted loan with a 15 percent compensating balance.

Solution

A Effective Interest Rate =

$$= \frac{\text{Interest on total loan}}{\text{Total loan}} \times 100 = \frac{50,000 \times .12}{50,000} \times 100$$

$$= \frac{6000}{50,000} \times 100 = \underline{\underline{12\%}}$$

B Effective Interest Rate

$$= \frac{\text{Interest on total loan}}{\text{Total loan - compensating balance}} \times 100$$

$$= \frac{50,000 \times .09}{50,000 - 20\% \text{ of } 50,000} \times 100 = \frac{4500}{40000} \times 100 = \underline{\underline{11.25\%}}$$

C Effective Interest Rate

$$= \frac{\text{Interest on total loan}}{(\text{Total loan - (Interest on Total loan + compensating balance)})} \times 100$$

$$= \frac{50,000 \times .0875}{(50,000 - (4375 + 50,000 \times .15))} \times 100 = \frac{4375}{38,125} \times 100 = \underline{\underline{11.48\%}}$$

Review Questions

A. Short Questions

1. Why short term financing is necessary ? Explain.
2. Why do the financial managers aware of the selection of sources of finance ?
3. What is a trade credit ? What are its main features ?
4. Examine the components of trade credit.
5. What is the cost of trade credit ? How it is determined ?
6. What is bank credit ? Distinguish between bank credit and trade credit.
7. How accounts play the role of short-term financing ? Examine.
8. What is the cost of bank credit ? How it is measured ?
9. Examine the role of commercial paper as the source of short term financing.
10. 10. What is a factoring ? What are the main functions of a factor ?
11. What is receivable financing ?
12. What is inventory financing ?

B. Broad Questions

13. Briefly discuss the major sources of short-term financing.
14. Discuss the modes of procedures of using security in short term financing.
15. What are the merits of demerits of short term financing? Explain.

Review Problems

Problem - 1

Gallinger Corporation projects an increase in sales from \$1.5 million to \$2 million, but it needs an additional \$300,00 of current assets to support this expansion. The money can be obtained from the bank at an interest rate of 13 percent, discount interest; no compensating balance is required. Alternatively, Gallinger can finance the expansion by no longer taking discounts, thus increasing accounts payable Gallinger purchases under terms of 2/10, net 30, but it can delay payment for an additional 35 days- paying in 65 days and thus becoming 35 days past due- without a penalty because of its suppliers' current excess capacity problems.

- a. Based strictly on effective annual interest rate comparisons, how should Gallinger finance its expansion ?
- b. What additional qualitative factors should Gallinger consider before reaching a decision ?

Problem – 2

The UFSU Corporation intends to borrow \$450,000 to support its short-term financing requirements during the next year. The company is evaluating its financing options at the bank where it maintains its checking account. UFSU's checking account balance, which averages \$50,000 can be used to help satisfy any compensating balance requirements the bank might impose. The financing alternatives offered by the bank include the following:

- Alternative- 1: A discount interest loan with a simple interest of $9 \frac{1}{4}$ percent and no compensating balance requirement.
- Alternative- 2: A ten percent simple interest loan that has a 15 percent compensating balance requirement.
- Alternative- 3: A \$1 million revolving line of credit with simple interest of $9 \frac{1}{4}$ percent paid on the amount borrowed and a $\frac{1}{4}$ percent commitment fee on the unused balance. No compensating balance is required.
- Compute the effective cost (rate) of each financing alternative assuming UFSU borrows \$450,000. Which alternative should UFSU use?
 - For each alternative, how much would UFSU have to borrow in order to have \$45,000 available for use (to pay the firms bills) ?

Problem – 3

Cooley Industries needs an additional \$500,000, which it plans to obtain through a factoring arrangement. The factor would purchase Cooley's accounts receivable and advance the invoice amount, minus a two percent commission on the invoices purchased each month. Cooley sells on terms of net 30 days. In addition, the factor charges a 12 percent annual interest rate on the total invoice amount, to be deducted in advance.

- What amount of accounts receivable must be factored to net \$50,000 ?
- If Cooley can reduce credit expenses by \$3,500 per month and avoid bad debt losses of 2.5 percent on the factored amount, what is the total dollar cost of the factoring arrangement ?
- What would be the total cost of the factoring arrangement if Cooley's funding needs rose to \$750,000 ? Would the factoring arrangement be profitable under these circumstances ?

Problem – 4

Boles Corporation needs to raise \$500,000 for one year to supply capital to a new store. Boles buys from its suppliers on terms of 3/10, net 90, and it currently pays on the 10th day and takes discounts, but it could forgo discounts, pay Alternatively, Boles could borrow from its bank on a 12 percent discount interest rate basis. What is the effective annual interest rate of the lower cost sources?

Problem – 5

Bankston Feed and Supply company buys on terms of 1/10, net 30, but it has not been taking discounts and has actually been paying in 60 rather than 30 days. Bankston’s balance sheet follows (thousands of dollars):

Cash	\$50	Accounts payable	\$ 500
Accounts receivable	450	Notes payable	50
Inventories	<u>750</u>	Accruals	<u>50</u>
Current assets	\$1,250	Current liabilities	\$ 600
		Long term debt	150
Fixed assets	<u>750</u>	Common equity	<u>1,250</u>
Total assets	\$2,000	Total liabilities and equity	\$2,000

*Stated net of discounts.

Now Bankston’s suppliers are threatening to stop shipments unless the company begins making prompt payments (that is, paying in 30 days or less). The firm can borrow on a one-year note (call this a current liability) from its bank at a rate of 15 percent, discount interest, with a 20 percent compensating balance required. (Bankston’s \$50,000 of cash is needed for transactions; it cannot be used as part of the compensating balance).

- a. Determine what action Bankston should take by calculating (1) the cost of non free trade credit and (2) the cost of the bank loan.
- b. Assume that Bankston forgoes discounts and then borrows the amount needed to become current on its payables from the bank. How large will the bank loan be?