Working Capital Management

DCOM505

Edited by:
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LOVELY PROFESSIONAL UNIVERSITY

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WORKING CAPITAL MANAGEMENT

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SYLLABUS

Working Capital Management

Objectives: The course will enable the student to manage activities in the area of working capital in an enterprise and help the students to do advance study in the field of financial-management through detailed analysis of financial statements, liquidity crises, cash optimization, credit analysis etc. The student will learn how to apply sound techniques for managing inventory.

S. No.	Description
1.	Concept & importance of Working capital management, types of working capital, factors affecting working capital requirements.
2.	Meaning & significance of operating cycle and cash cycle, estimation of working capital requirements, liquidity vs. profitability.
3.	Financing of working capital needs: Commercial banks, Commercial papers, Factoring, Trade credit, Accrued expenses, Deferred income as source for working capital.
4.	Approaches to determine an appropriate financing mix, working capital and banking policy (Recommendations of Dahejja Tandon, Chore & Marathe & Kannan committees.) MPBF norms, Managing credit risk, Disbursement and follow up of working capital finance by bank.
5.	**Cash Management:** Aspects of cash management, Motives for holding cash and marketable securities.
6.	Factors determining the optimum cash balance, Models-Baumol, Miller Orr, Stone, Beranek.
7.	Cash Planning, Cash budget simulation and cash balance uncertainties, hedging vs. interest rate, future & options. Treasury management, Reasons for Cash flow problems.
8.	**Receivable management:** Introduction, Objectives of trade credit, credit policies. Dimensions of receivable management, collections from receivables, role of factoring in receivables management.
9.	**Inventory Management:** Introduction, tools & techniques of inventory management. Inventory control models, valuation of inventories, Inventory management and cash flow time line.
10.	Integration of working capital and capital investment process. Working capital management practices in India.

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Unit 1: Introduction to Working Capital Management

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Objectives

After studying this unit, you will be able to:

- Know the concept of working capital
- Discuss the importance of working capital
- Identify the factors affecting working capital requirements
- Explain the levels of working capital investment
- Describe the overall working capital policy

Introduction

Working capital can be understood as a measure of both a company's efficiency and its short-term financial health. For a layman, it simply means the difference between the current assets and current liabilities. It is the firm's holdings of current, or short-term, assets (such as cash).

Working capital is generally divided in two types, viz. gross working capital and net working capital. Gross Working Capital (GWC) is nothing but the total current or circulating assets. Net working capital, NWC (current assets minus current liabilities), provides an accurate assessment of the liquidity position of firm with the liquidity-profitability dilemma solidly authenticated in the financial scheme of obligations which mature within a twelve-month period.

As we have seen, the two main components of the working capital are assets and liabilities. First, short-term, or current liabilities constitute the portion of funds which have been planned for and raised. Since management must be concerned with proper financial structure, these and

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other funds must be raised judiciously. Short-term or current assets constitute a part of the asset-investment decision and require diligent review by the firm's executives.

Further, since there exists a close correlation between sales fluctuations and invested amounts in current assets, a careful maintenance of the proper asset and funds should be ensured.

1.1 Concept of Working Capital

Working capital typically means the firm's holdings of current, or short-term, assets such as cash, receivables, inventory, and marketable securities. Working capital refers to that part of firm's capital which is required for financing short-term or current assets such as cash, marketable securities, debtors, and inventories. In other words working capital is the amount of funds necessary to cover the cost of operating the enterprise.

Working capital means the funds (i.e.; capital) available and used for day-to-day operations (i.e.; working) of an enterprise. It consists broadly of that portion of assets of a business which are used in or related to its current operations. It refers to funds which are used during an accounting period to generate a current income of a type which is consistent with major purpose of a firm existence.

Working Capital is the money used to make goods and attract sales. The less Working Capital used to attract sales, the higher is likely to be the return on investment. Working Capital management is about the commercial and financial aspects of Inventory, credit, purchasing, marketing, and royalty and investment policy. The higher the profit margin, the lower is likely to be the level of Working Capital tied up in creating and selling titles. The faster that we create and sell the books the higher is likely to be the return on investment. Thus, when we have been using.

Caution The larger the percentage of funds obtained from short-term funds, the more aggressive (and risky) in firm's working capital policy and vice-versa.

There are two possible interpretations of working capital concept:

l. Balance Sheet Concept

2. Operating Cycle Concept

It goes without saying that the pattern of management will be very largely influenced by the approach taken in defining it. Therefore, the two concepts are discussed separately in a nutshell.

1.1.1 Balance Sheet Concept

There are two interpretations of working capital under the balance sheet concept. It is represented by the excess of current assets over current liabilities and is the amount normally available to finance current operations. But, sometimes working capital is also used as a synonym for gross or total current assets. In that case, the excess of current assets over current liabilities is called the net working capital or net current assets. Economists like Mead, Malott, Baket and Field support the latter view of working capital. They feel that current assets should be considered as working capital as the whole of it helps to earn profits; and the management is more concerned with the total current assets as they constitute the total funds available for operational purposes. On the other hand, economists like Lincoln and Salvers uphold the former view. They argue that

1. In the long run what matters is the surplus of current asserts over current liabilities;

2. It is this concept which helps creditors and investors to judge the financial soundness of the enterprise;

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3. What can always be relied upon to meet the contingencies, is the excess of current assets over the current liabilities since this amount is not to be returned; and

4. This definition helps to find out the correct financial position of companies having the same amount of current assets.

Institute of Chartered Accountants of India, while suggesting a vertical form of balance sheet, also endorsed the former view of working capital when it described net current assets as the difference between current assets and current liabilities.

The conventional definition of working capital in terms of the difference between the current assets and the current liabilities is somewhat confusing. Working capital is really what a part of long-term finance is locked in and used for supporting current activities. Consequently, the larger the amount of working capital so derived, greater the proportion of long-term capital sources siphoned off to short-term activities. It is about tight working capital situation, the logic of the above definition would perhaps indicate diversion to bring in cash, under the conventional method, working capital would evidently remain unchanged. Liquidation of debtors and inventory into cash would also keep the level of working capital unchanged. A relatively large amount of working capital according to this definition may produce a false sense of security at a time when cash resources may be negligible, or when these may be provided increasingly by long-term fund sources in the absence of adequate profits. Again, under the conventional method, cash enters into the computation of working capital. But it may have been more appropriate to exclude cash from such calculations because one compares cash requirements with current assets less current liabilities. The implication of this in conventional working capital computations is that during the financial period current assets get converted into cash which, after paying off the current liabilities, can be used to meet other operational expenses. The paradox, however, is that such current assets as are relied upon to yield cash must themselves to be supported by long-term funds until are converted into cash.

Task Analyse the paradox in computing the working capital.

At least, three points seem to emerge from the above. First, the balance sheet definition of working capital is perhaps not so meaningful, except as an indication of the firm's current solvency in repaying its creditors. Secondly, when firms speak of shortage of working capital, they in fact possible imply scarcity of cash resources. Thirdly, in fund flow analysis an increase in working capital, as conventionally defined, represents employment or application of funds.

1.1.2 Operating Cycle Concept

A company's operating cycle typically consists of three primary activities; purchasing resources, producing the product, and distributing (selling) the product. These activities create funds flows that are both unsynchronized because cash disbursements usually take place before cash receipts.

Example: Payments for resource purchases takes place before the collection of receivables.

They are uncertain because future sales and costs, which generate the respective receipts and disbursements, cannot be forecasted with complete accuracy. If the firm is to maintain a cash balance to pay the bills as they come due. In addition, the company must invest in inventories to fill customer orders promptly. And, finally, the company invests in accounts receivable to extend credit to its customers.

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Figure 1.1: Operating Cycle of Typical Company

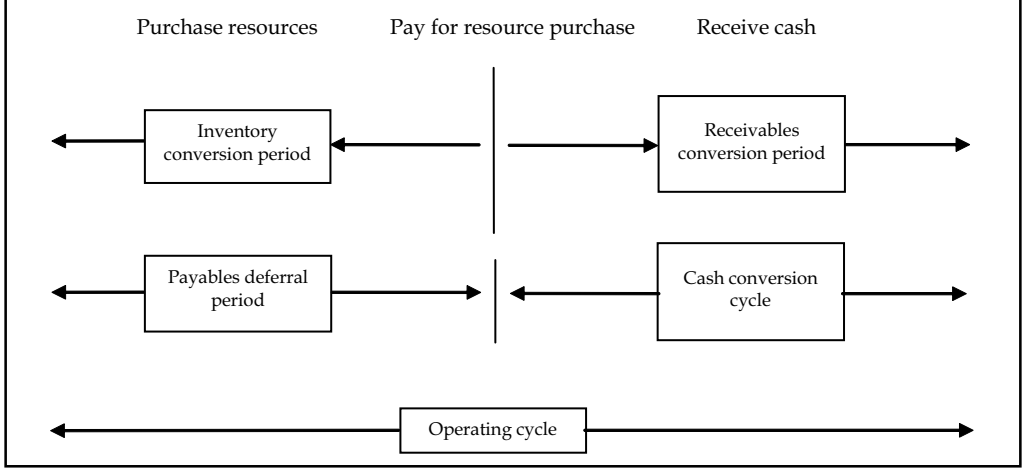

Figure 1.1 shows the operating cycle of a typical firm. The operating cycle is equal to the length of the inventory and receivables conversion periods:

Operating cycle = Inventory conversion period + Receivables conversion period

The inventory conversion period is the length of time required to produce and sell the product. It is defined as follows:

$$\text{Inventory conversion period} = \frac{\text{Average inventory}}{\text{Cost of sales}/365}$$

The payables deferral period is the length of time the firm is able to defer payment on its various resource purchases (for example, materials, wages, and taxes). Equation is used to calculate the payables deferral period:

$$\text{Payables deferral period} = \frac{\text{Accounts payable + Salaries, benefits, and Payroll taxes payable}}{\text{(Cost of sales + Selling, general and Administrative expense)}/365}$$

Finally, the cash conversion cycle represents the net time interval between the collection of cash receipts from product sales and the cash payments for the company's various resource purchases. It is calculated as follows:

Cash conversion cycle = Operating cycle – Payable deferral period

Did u know? **What is cash conversion cycle?**

The most liquid asset is cash in hand and cash at bank. The time required to complete the following cycle of events in case of a manufacturing firm is called the cash conversion cycle or the operating cycle:

1. Conversion of cash into raw materials
2. Conversion of raw materials into work in process
3. Conversion of work in process into finished goods

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4. Conversion of finished goods into debtors and bills receivables through sales
5. Conversion of debtors and bills receivables into cash

The cash conversion cycle shows the time interval over which additional no spontaneous sources of working capital financing must be obtained to carry out the firm's activities. An increase in the length of the operating cycle, without a corresponding increase in the payables deferral period, lengthens the cash conversion cycle and creates further working capital financing needs for the company.

Operating cycle in case of a trading firm consists of the following events:

1. Cash into inventories
2. Inventories into accounts receivable
3. Accounts receivable into cash

Self Assessment

Fill in the blanks:

1. There exists a close correlation between sales fluctuations and invested amounts in .....
2. Institute of Chartered Accountants of India suggests and follows the system of a ..... form of balance sheet.
3. Under the conventional method, ... enters into the computation of working capital.
4. A company's operating cycle typically consists of three primary activities: ..... , ... and .....
5. The ..... shows the time interval over which additional no spontaneous sources of working capital financing must be obtained to carry out the firm's activities.

1.2 Importance of Working Capital

Working capital is the life blood and nerve centre of a business. Just as circulation of blood is essential in the human body for marinating life, working capital is very essential to maintain the smooth running of a business. No business can run successfully without an adequate amount of working capital. The main advantages of maintaining adequate amount of working capital are as follows:

1. ***Solvency of the business:*** Adequate working capital helps in maintaining solvency of the business by providing uninterrupted flow of production.
2. ***Goodwill:*** Sufficient working capital enables a business concern to make prompt payments and hence helps in creating and maintaining goodwill.
3. ***Easy Loans:*** A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and other on easy and favourable terms.
4. ***Cash discounts:*** Adequate working capital also enables a concern to avail cash discounts on the purchases and hence it reduces costs.
5. ***Regular supply of raw materials:*** Sufficient working capital ensures regular supply of raw materials and continuous production.

Notes

6. ***Regular payment of salaries, wages and other day-to-day commitments:*** A company which has ample working capital can make regular payment of salaries, wages and other day-to-day commitments which raises the morale of its employees, increases their efficiency, reduces wastages and costs and enhances production and profits.

7. ***Exploitation of favourable market condition:*** Only concern with adequate working capital can exploit favourable market conditions such as purchasing its requirements in bulk when the prices are lower and by holding its inventories for higher prices.

8. ***Ability to face crisis:*** Adequate working capital enables a concern to face business crisis in emergencies such as depression because during such periods, generally, there is much pressure on working capital.

9. ***Quick and regular return on investments:*** Every investor wants a quick and regular return on his investments. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors as there may not be much pressure to plough back profits. This gains the confidence of its investors and creates a favourable market to raise additional funds ion the future.

10. ***High morale:*** Adequacy of working capital creates an environment of security, confidence, and high morale and creates overall efficiency in a business.

Caselet

Serbian Entrepreneur Revives Family Business

Predrag Todorovic's company produces wheels for all sorts of containers, including medical containers and garbage containers, in Northern Serbia. Todorovic has worked in the family business since it was founded by his father twenty years ago.

Originally, the company depended heavily upon exporting goods. But sales evaporated after the war broke out and sanctions were imposed. Businesses, dependant upon domestic sales, struggled through the early 1990's and became crippled in 1997 by Milosevic's tax police, who took money unfairly from businesses. Todorovic had no choice – he was forced to shrink his company.

While struggling to maintain his business, Todorovic learned through a friend about a USAID-funded small business loan program in Serbia and Montenegro implemented by Opportunity International (OI). Todorovic had never borrowed money before. Through the program, Todorovic was able to obtain 5000€ in working capital to expand production and re-establish export links. This way he gained the adequacy in capital management and was able to face crisis.

Source: www.usaid.gov

Self Assessment

State whether the following statements are true or false:

6. No business can run successfully without an adequate amount of working capital.

7. Working capital enables a concern to avail cash discounts on the purchases and hence it reduces costs.

8. Working capital ensures regular supply of raw materials and continuous production.

1.3 Factors Affecting Working Capital Requirements

Notes

The working capital requirement of a concern depends upon a large numbers of factors such as nature and size of business, the character of their operations, the length of production cycles, the rate of stock turnover and the state of economic situation. It is not possible to rank them because all such factors of different importance and the influence of individual factors changes for a firm overtime. However the following are important factors generally influencing the working capital requirement:

1. ***Nature or Character of Business:*** The working capital requirement of a firm basically depends upon the nature of this business. Public utility undertakings like electricity water supply and railways need very limited working capital because they offer cash sales only and supply services, not products and as such no funds are tied up in inventories and receivables. Generally speaking it may be said that public utility undertakings require small amount of working capital, trading and financial firms require relatively very large amount, whereas manufacturing undertakings require sizable working capital between these two extremes.

2. ***Size of Business/Scale of Operations:*** The working capital requirement of a concern is directly influenced by the size of its business which may be measured in terms of scale of operations.

3. ***Production Policy:*** In certain industries the demand is subject to wide fluctuations due to seasonal variations. The requirements of working capital in such cases depend upon the production policy.

4. ***Manufacturing Process/Length of Production Cycle:*** In manufacturing business the requirement of working capital increases in direct proportion of length of manufacturing process. Longer the process period of manufacture, larger is the amount of working capital required.

5. ***Seasonal Variation:*** In certain industries raw material is not available through out the year. They have to buy raw materials in bulk during the season to ensure and uninterrupted flow and process them during the entire year.

6. ***Rate of Stock Turnover:*** There is a high degree of inverse co-relationship between the quantum of working capital; and the velocity or speed with which the sales are affected. A firm having a high rate of stock turnover will need lower amount of working capital as compared to affirm, having a low rate of turnover.

7. ***Credit Policy:*** The credit policy of a concern in its dealing with debtors and creditors influence considerably the requirement of working capital. A concern that purchases its requirement on credit and sell its products/services on cash require lesser amount of working capital.

8. ***Business Cycle:*** Business cycle refers to alternate expansion and contraction in general business activity. In a period of boom i.e., when the business is prosperous, there is a need of larger amount of working capital due to increase in sales, rise in prices, optimistic expansion of business contracts sales decline, difficulties are faced in collection from debtors and firms may have a large amount of working capital lying idle.

9. ***Rate of Growth of Business:*** The working capital requirement of a concern increase with the growth and expansion of its business activities. Although it is difficulties to determine the relationship between the growth in the volume of business and the growth in the working capital of a business, yet it may be concluded that of normal rate of expansion in the volume of business, we may have retained profits to provide for more working capital but in fast growth in concern, we shall require larger amount of working capital.

Notes

10. ***Price Level Changes:*** Changes in the price level also effect the working capital requirement. Generally the rising prices will require the firm to maintain larger amount of working capital as more funds will be required to maintain the same current assets.

Case Study

Mysore Lamps Limited

Mysore Lamps Limited is a company specializing in the production of fluorescent lamps. The company has been maintaining the quality of its products and due to the efforts of its marketing manager; the company has been able to capture a sizeable share of the product market in the recent past. The company is planning to expand in the same product line. Mr. Mysore, the Managing Director of the company, is confronted with the problem of increasing working capital due to the expansion plans of the company.

Mysore Lamps Limited was set up in 1991 with an authorized capital of ₹ 110 crore and faced heavy competition in the initial years of commencement of business. During 2006, the company could make a dent in the fluorescent lamps market and its position as on December 31, 2006, was as shown in Exhibit 1.

Exhibit 1: Balance Sheet

(₹ in lakh)

Liabilities	₹	Assets	₹
Capital	1500	Fixed assets	1000
Reserves	762	Current assets	1862
Long-term loan	400	Raw materials	200
Current liabilities	200	Work-in-progress	287
Finished goods	450	Accounts receivables	675
Bank overdraft	962	Cash	250
Total	4274	Total	4274

During the year 2006, the company was able to sell 50 lakh pieces of fluorescent lamps a ₹ 60 with a profit margin of 10 per cent. The raw material comprised about 50 per cent of the selling price; while wages and overheads accounted for 12 and 18 per cent, respectively.

As a policy, the company keeps raw material stock for two months of its requirements. In order to make prompt supply to customers on orders received, finished goods stock for two months requirements is maintained, and sales credit of three months is given to customers. Due to the standing of the company in the market, the company is able to enjoy 2 months from its suppliers. The production process is of 30 days duration.

Mr. Mysore is seriously considering the proposal for expansion by installing an automatic plant costing ₹ 30 crore. The expansion will bring in an additional capacity of 100 lakh units per annum. Mr. Mysore is not worried about the financing of this plant as the same would be done for the retained earnings supplemented by finances from Mr. Mysore's personal sources. He expects that the company would be able to increase its sale from 50 lakh pieces after the expansion scheme.

Questions

1. As a manager, what steps would you take to effectively manage the working capital in an inflationary situation?

Contd...

Notes

2. What additional informations are required while evaluating the additional working capital requirement and expansion plans?
3. What steps must be taken to manage the working capital effectively under inflationary situation? What would be the effect of expansion plan on working capital requirement?

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books.

Self Assessment

State whether the following statements are true or false:

9. Working capital requirement of a concern is not influenced by the size of its business.
10. There is a high degree of direct co-relationship between the quantum of working capital; and the velocity or speed with which the sales are affected.
11. The working capital requirement of a concern decrease with the growth and expansion of its business activities.

1.4 Levels of Working Capital Investment

In a "perfect" world, there would be no necessity for working capital assets and liabilities. In such a world, there would be no uncertainty, no transaction costs, information search costs, scheduling costs, or production and technology constraints. The unit cost of producing goods would not vary with the amount produced. Firms would borrow and lend at the same interest rate. Capital, labor, and product markets would reflect all available information and would be perfectly competitive. In such a world, it can be shown that there would be no advantage for invest or finance in the short-term.

But the world in which real firms function is not perfect. It is characterized by the firm's considerable uncertainty regarding the demand, market price, quality, and availability of its own products and those of suppliers. There are transaction costs for purchasing or selling goods or securities. Information is faced with limits on the production capacity and technology that it can employ. There are spreads between the borrowing and lending rates for investments and financing of equal risk. Information is not equally distributed and may not be fully reflected in the prices in product and labor markets, and these markets may not be perfectly competitive.

These real-world circumstances introduce problems with which the firm must deal. While the firm has many strategies available to address these circumstances, strategies that utilize investment or financing with working capital accounts often offer a substantial advantage over other techniques.

Example: Assume that the firm is faced with uncertainty regarding the level of its future cash flows and will incur substantial costs if it has insufficient cash to meet expenses. Several strategies may be formulated to address this uncertainty and the costs that it may engender. Among these strategies are some that involve working capital investment or financing such as holding additional cash balances beyond expected needs, holding a reserve of short-term borrowing capacity. One of these strategies (or a combination of them) may well be the least costly approach to the problem.

Similarly, the existence of fixed set-up costs in the production of goods may be addressed in several ways, but one possible alternative is hold inventory.

Notes

By these examples, we see that strategies using working capital accounts are some of the possible ways firms can respond to many of the problems engendered by the imperfect and constrained world in which they deal. One of the major features of this world is uncertainty (risk), and it is this feature that gives rise to many of the strategies involving working capital accounts. Moreover, a firm's net working capital position not only is important from an internal standpoint; it also is widely used as one measure of the firm's risk. Risk, as used in this context, deals with the probability that a firm will encounter financial difficulties, such as the inability to pay bills on time. All other things being equal, the more net working capital a firm has, the more likely that it will be able to meet current financial obligations. Because net working capital is one debt financing. Many loan agreements with commercial banks and other lending institutions contain provision requiring the firm on maintain a minimum net working capital position. Likewise, bond indentures also often contain such provisions. The overall policy considers both the level of working capital investment and its financing. In practice, the firm has to determine the joint impact of these two decisions upon its profitability and risk.

The size and nature of a firm's investment in current assets is a function of a number of different factors, including the following:

1. The type of products manufactured.
2. The length of the operating cycle.
3. The sales level (because higher sales require more investment in inventories and receivables).
4. Inventory policies (for example, the amount of safety stocks maintained; that is, inventories needed to meet higher than expected demand or unanticipated delays in obtaining new inventories).
5. Credit policies.
6. How efficiently the firm manages current assets. (Obviously, the more effectively management economizes on the amount of cash, marketable securities, inventories, and receivables employed, the smaller the working capital requirements).

For the purposes of discussion and analysis, these factors are held constant in the rest of our analysis.

Self Assessment

Fill in the blanks:

12. The unit cost of producing goods would not vary with the amount ……
13. There are ……..between the borrowing and lending rates for investments and financing of equal risk.
14. ……..deals with the probability that a firm will encounter financial difficulties, such as the inability to pay bills on time.

1.5 Optimal Level of Working Capital Investment

The optimal level of working capital investment is the level expected to maximize shareholder wealth. It is a function of several factors, including the variability of sales and cash flows and the degree of operating and financial leverage employed by the firm. Therefore no single working capital investment policy is necessarily optimal for all firms.

Notes

Proportions of Short-term Financing

Not only a firm have to be concerned about the level of current assets; it also has to determine the proportions of short-and long-term debt to use in financing use in these assets. The decision also involves trade-offs between profitability and risk.

Sources of debt financing are classified according to their maturities. Specifically, they can be categorized as being either short-term or long-term, with short-term sources having maturities of one year or less and long-term sources having maturities of greater than one year.

Cost of Short-term versus Long-term Debt

Historically long-term interest rates normally exceeds short-term rate because of the reduce flexibility of long-term borrowing relative to short-term borrowing. In fact, the effective cost of long-term debt, even went short-term interest rates are equal to or greater than long-term rates. With long-term debt, a firm incurs the interest expense even during times went it has no immediate need for the funds, such as during seasonal or cyclical downturns. With short-term debt, in contrast, the firm can avoid the interest costs on unneeded funds by playing of (or not renewing) the debt. Therefore, the long-term debt generally is higher than the cost of short-term debt.

Risk of Long-term versus Short-term Debt

Borrowing companies have different attitudes toward the relative risk of long-term versus short-term debt then lenders. Whereas lenders normally feel that risk increases with maturity, borrowers feel that there is more risk associated with short-term debt. The reasons for this are two fold.

First, there is always the chance that a firm will not be able to refund its short-term debt. When a firm's debt matures, it either pays off the debt as part of a debt reduction program or arranges new financing. At the time of maturity, however, the firm could faced with financial problems resulting from such events as strikes, natural disasters, or recessions that cause sales and cash inflows to decline. Under these circumstances the firm may find it very difficult or even impossible to obtain the needed funds. This could lead to operating and financial difficulties.

Notes The more frequently affirm must refinance debt, the greater is the risk of its not being able to obtain the necessary financing.

Second, short-term interest rates tend to fluctuate more over time than long-term interest rates. As a result, a firm's interest expenses and expected earnings after interest and taxes are subject to more variation (risk) over time with short-term debt than with long-term debt.

Self Assessment

Fill in the blanks:

15. Short-term interest rates tend to fluctuate ..... over time than long-term interest rates.
16. The ..... level of working capital investment is the level expected to maximize shareholder's wealth.
17. ..... single working capital investment policy is necessarily optimal for all firms.

Notes

1.6 Overall Working Capital Policy

The goal of a company is to create value for its shareholders. In order to create this value, the company has to create a competitive advantage to exploit inconsistencies in the market in which it operates; both its trading and financial environments. As such, Lawrence needs to develop a comprehensive strategic, financial, and implementation plan to facilitate a successful Working Capital Policy, while fully leveraging existing resources and making their bottom line more profitable while managing risks and events that would threaten the success of the endeavor.

Working capital management involves decisions with regard to levels of cash, receivables, and inventory. Too much working capital is costly, reducing profitability and return on capital. However, too little can also be costly in terms of lost opportunities and the company may suffer increases in cost of capital due to too little cash if it cannot pay bills on time.

A business firm can adapt any of the following working capital policies:

1. Conservative working capital policy
2. Aggressive working capital policy
3. Moderate working capital policy

Let us understand each of them one by one.

1. Under conservative approach, the firm carries high investment in current assets such as cash, marketable securities and carries large amount of inventories and grants generous terms of credit to customers resulting in a high level of debtors. The consequences of conservative working capital policy are quick deliveries to customers and more sales due to generous credit terms.
2. Under aggressive working capital policy, investment in current assets is very low. The firm keeps less amount of cash and marketable securities, manages with less inventories and tight credit terms resulting in low level of debtors. The consequences of aggressive working capital policy are frequent production stoppages, delayed deliveries to customers and loss of sales.
3. Moderate approach is always maintaining required amount of current assets depending upon sales. A trade off between two costs namely carrying cost and shortage cost determines the optimal level of current assets. Costs that rise with current assets i.e. that cost of financing a higher level of current assets form carrying costs. Shortage costs are in the form of disruption in production schedule, loss of Sales and loss of goodwill.

The optimum level of current assets is denoted by the total costs (= carrying costs + shortage costs) minimized at that level.

Self Assessment

Fill in the blanks:

18. The goal of a company is to create value for its .....
19. Under ..... working capital policy, investment in current assets is very low.
20. Too much working capital is costly, reducing ..... and .....

1.7 Summary

- Working capital is a financial metric which represents operating liquidity available to a business.

Notes

- Along with fixed assets such as plant and equipment, working capital is considered a part of operating capital.
- It is calculated as current assets minus current liabilities.
- If current assets are less than current liabilities, an entity has a working capital deficiency, also called a working capital deficit.
- Working capital represents the funds available with the company for day-to-day operations.
- Working capital finances the cash conversion cycle.
- Company cannot survive with negative working capital which represents that the company has no funds for day-to-day operations.
- Some of the factors that can affect a firm's working capital level are type/nature of business, volume of sales, seasonality and lengths of operating and cash cycle.

1.8 Keywords

Cost of Sales: Cost of sales is equal to the difference between the sales and the gross profit.

Current Assets: Current assets are cash and other assets expected to be converted to cash, sold, or consumed either in a year or in the operating cycle, without disturbing the normal operations of a business.

Current Liabilities: A company's debts or obligations due within one year.

Working Capital: It means the firm's holdings of current or short-term asset.

1.9 Review Questions

1. Which portion of funds would the current liabilities constitute in a firm?
2. What might happen if the current liabilities of a firm are larger than the current assets it has? What will be its effect on the working of the firm?
3. Under Aggressive working capital policy, investment in current assets is very low. Comment.
4. What will be the consequences of conservative working capital policy?
5. In your opinion, what does the risk increases with – maturity or short-term debt and why?
6. According to you, which would be larger – long-term interest rates or short-term interest rates and why?
7. Why does every company vying to create competitive advantages in the market?
8. A firm's net working capital position not only is important from an internal standpoint; it also is widely used as one measure of the firm's risk. Justify this statement.
9. What do you think as the reason for the public utility undertakings needing very limited working capital?
10. Do you think that an adequate working capital enables a firm to exploit of favourable market conditions? Support your answer with proper reasons.
11. A firm's net working capital is sometimes defined as the portion of current assets financed with long-term funds, can you show diagrammatically why this definition is valid?

Notes

12. How can the differences between the returns on current and fixed assets and the cost of current liabilities and long-term funds be used to determine how best to change a firm's net working capital?
13. "Uncertainty makes it difficult for a financial manager to predict the company's requirements for short-term funds". Discuss. What steps can the financial manager take to minimize the resulting risks to the company?
14. Why is no single working capital investment and financing policy necessarily optimal for all firms? What additional factors need to be considered in establishing a working capital policy?

Answers: Self Assessment

1.	current assets	2.	vertical
3.	cash		
4.	purchasing resources, producing the product, distributing (selling) the product		
5.	cash conversion cycle	6.	True
7.	True	8.	True
9.	False	10.	False
11.	False	12.	produced
13.	spreads	14.	Risk
15.	More	16.	optimal
17.	No	18.	shareholders
19.	aggressive	20.	profitability, return on capital

1.10 Further Readings

Books

D.R. Mehta, *Working Capital Management*, Prentice-Hall Inc., 1974.

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Online links

www.studyfinance.com

www.planware.org/workingcapital

Unit 2: Planning of Working Capital

Notes

CONTENTS

Objectives

After studying this unit, you will be able to:

- Identify the types of working capital
- Know the meaning and significance of operating cycle
- Discuss the meaning and significance of cash cycle
- Explain the estimation of working capital requirements
- Describe the liquidity and profitability

Introduction

Cash is the lifeline of a company. If this lifeline deteriorates, so does the company's ability to fund operations, reinvest and meet capital requirements and payments. Understanding a company's cash flow health is essential to making investment decisions.

Notes

Working capital is of major importance to internal and external analysis because of its close relationship with the current day-to-day operations of a business. Every business needs funds for two purposes.

1. Long-term funds are required to create production facilities through purchase of fixed assets such as plants, machineries, lands, buildings, etc.
2. Short-term funds are required for the purchase of raw materials, payment of wages, and other day-to-day expenses. It is otherwise known as revolving or circulating capital.

A business firm must maintain an adequate level of working capital in order to run its business smoothly. It is worthy to note that both excessive and inadequate working capital positions are harmful. Working capital is just like the heart of business. If it becomes weak, the business can hardly prosper and survive. No business can run successfully without an adequate amount of working capital.

2.1 Types of Working Capital

The concept of Working Capital includes current assets and current liabilities both. There are two concepts of working capital. They are Gross and Net Working Capital.

2.1.1 Gross Working Capital

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. It includes cash, short-term securities, debtors (account receivables or book debts), bills receivables and stock (inventory).

The concept of Gross Working Capital focuses attention on two aspects of current assets' management. They are:

1. Way of optimizing investment in Current Assets.
2. Way of financing current assets.

1. ***Optimizing Investment in Current Assets:*** Investment in Current Assets should be just adequate i.e., neither in excess nor deficit because excess investment increases liquidity but reduces profitability as idle investment earns nothing and inadequate amount of working capital can threaten the solvency of the firm because of its inability to meet its obligation. It is taken into consideration that the Working Capital needs of the firm may be fluctuating with changing business activities which may cause excess or shortage of Working Capital frequently and prompt management can control the imbalances.
2. ***Way of Financing Current Assets:*** This aspect points to the need of arranging funds to finance Country Assets. It says whenever a need for working Capital arises; financing arrangement should be made quickly. The financial manager should have the knowledge of sources of the working capital funds as wheel as investment avenues where idle funds can be temporarily invested.

2.1.2 Net Working Capital

Net Working Capital refers to the difference between Current Assets and Current Liabilities are those claims of outsiders, which are expected to mature for payment within an accounting year. It includes creditors or accounts payables, bills payables and outstanding expenses.

Net Working Capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities and vice versa.

Notes

As compared with the gross working capital, net is a qualitative concept. It indicates the liquidity position of and suggests the extent to which working Capital needs may be financed by permanent sources of funds. Current Assets should be optimally more than Current Liabilities. It also covers the point of right combination of long-term and short-term funds for financing current assets. For every firm a particular amount of net Working Capital is permanent. Therefore it can be financed with long-term funds.

Thus both concepts, Gross and Net Working Capital, are equally important for the efficient management of Working Capital. There are no specific rules to determine a firm's Gross and Net Working Capital but it depends on the business activity of the firm.

Every business concern should have neither redundant nor cause excess WC nor it should be short of WC. Both conditions are harmful and unprofitable for any business. But out of these two, the shortage of WC is more dangerous for the well being of the firms.

Working capital may be of many types, but the most important of them all are equity capital, debt capital, speciality capital and sweat equity. Each of these is a separate category of financial and has its own benefits and characteristics.

Equity Capital

Equity capital can be understood as the invested money that is not repaid to the investors in the normal course of business. It represents the risk capital staked by the owners through purchase of the firm's common stock (ordinary shares). Its value is computed by estimating the current market value of everything owned by the firm from which the total of all liabilities is subtracted. On the balance sheet of the firm, equity capital is listed as stockholders' equity or owners' equity. Equity Capital is also known as equity financing, share capital, net worth and book value.

There are some businesses that are funded entirely with equity capital (cash written by the shareholders or owners into the company that have no offsetting liabilities.) Although it is the favored form for most people because you cannot go bankrupt, it can be extraordinarily expensive and require massive amounts of work to grow your enterprise.

Example: Microsoft is an example of such an operation because it generates high enough returns to justify a pure equity capital structure.

Debt Capital

Debt capital is the capital that a business raises by taking out a loan. It is a loan made to a company that is normally repaid at some future date.

Notes Debt capital differs from equity capital because subscribers to debt capital do not become part of the owners of the business, but are merely creditors.

Debt capital ranks higher than equity capital for the repayment of annual returns. This means that legally, the interest on debt capital must be repaid in full before any dividends are paid to any suppliers of equity.

Debt capital is that type of capital which is infused into a business with the understanding that it must be paid back at a predetermined future date. In the meantime, the owner of the capital (typically a bank, bondholders, or a wealthy individual), agree to accept interest in exchange for you using their money.

Notes

Did u know? The suppliers of debt capital usually receive a contractually fixed annual percentage return on their loan, and this is known as the coupon rate.

Think of interest expense as the cost of "renting" the capital to expand your business; it is often known as the cost of capital. For many young businesses, debt can be the easiest way to expand because it is relatively easy to access. The profits for the owners is the difference between the return on capital and the cost of capital.

Example: If you borrow ₹ 1,00,000 and pay 10% interest yet earn 15% after taxes, the profit of 5%, or ₹ 5,000, would not have existed without the debt capital infused into the business.

Specialty Capital

This is the gold standard. There are a few sources of capital that have almost no economic cost and can take the limits off of growth. They include things such as a negative cash conversion cycle (vendor financing), insurance float, etc.

Negative Cash Conversion Cycle (Vendor Financing)

Imagine you own a retail store. To expand your business, you need ₹ 1 crore in capital to open a new location. Most of this is the result of needing to go out, buy your inventory, and stock your shelves with merchandise. You wait and hope that one day customers come in and pay you. In the meantime, you have capital (either debt or equity capital) tied up in the business in the form of inventory.

Now, imagine if you could get your customers to pay you before you had to pay for your merchandise. This would allow you to carry far more merchandise than your capitalization structure would otherwise allow.

Typically, vendor financing can be measured in part by looking at the percentage of inventories to accounts payable (the higher the percentage, the better), and analyzing the cash conversion cycle; the more days "negative", the better. Dell Computer was famous for its nearly two or three week negative cash conversion cycle which allowed it to grow from a college dorm room to the largest computer company in the world with little or no debt in less than a single generation.

Case Study

Vendor Financing at AutoZone

AutoZone Inc. is the largest U.S. retailer of automotive parts and accessories to do-it-yourself (DIY) customers by number of stores. The company began operations in 1979 and at August 30, 2008, operated 4,092 stores in the United States and Puerto Rico, and 148 in Mexico. Each of its stores carries an extensive product line for cars, sport utility vehicles, vans and light trucks, including new and remanufactured automotive hard parts, maintenance items, accessories and non-automotive products. In many of our stores we also have a commercial sales program that provides commercial credit and prompt delivery of parts and other products to local, regional and national repair garages, dealers and service stations.

Contd...

Notes

The number-one retailer of automotive parts and accessories has seen net income increase from $245 million in 1999 to $642 million in 2008. Gross profit for fiscal 2008 was $3.268 billion, or 50.1% of net sales, compared with $3.064 billion, or 49.7% of net sales, for fiscal 2007. The increase in gross profit as a percent of net sales was due to the positive impact of category management efforts, partially offset by increased distribution expense relating to higher fuel costs. At the same time, earnings per share have risen from $1.63 to $6.40. Common equity, on the other hand, has fallen from $1.3 billion to $171 million while the debt to equity ratio has skyrocketed from around 40% to over 90%. There are two primary reasons:

1. AZO has repurchased nearly half of its outstanding shares over the past five to ten years, decimating common equity while providing a nice boost to EPS.
2. The management team has successfully migrated over 90% of vendors to a pay-on-demand arrangement, increasing the accounts payable balance substantially while reducing the investment in working capital.

Vendor funding is primarily recorded as a reduction to inventories and recognized as a reduction to cost of sales as the inventories are sold; however, vendor funding for specific selling activities is recorded as a reduction to operating, selling, general and administrative expenses. AutoZone has since long convinced its vendors to put their products on its shelves and retain ownership until the moment that a customer walks up to the front of one of AutoZone's stores and pays for the goods. At that precise second, the vendor sells it to AutoZone which in turn sells it to the customer. This allows them to expand far more rapidly and return more money to the owners of the business in the form of share repurchases or cash dividends because they don't have to tie up hundreds of millions of dollars in inventory. In the meantime, the increased cash in the business as a result of more favorable vendor terms and/or getting AutoZone's customers to pay it sooner allows the company to generate more income than its equity or debt alone would permit.

AutoZone classified the majority of its funding as a reduction to inventory; however, during the current year it began to transition to more specific promotions and selling activities as it increased its efforts with vendors to develop tactics to allow them to drive sales and showcase their product, which affect selling, general and administrative expenses.

Questions

1. What is your main finding by the analysis of the case above?
2. What modifications did AutoZone made in its strategy for vendor financing and how did it benefit the organization?

Source: www.wikinvest.com

Insurance Float

Insurance companies that collect money and can generate income by investing the funds before paying it them out in the future in the form of policyholder payouts when a car is damaged, or replacing a home when destroyed in a tornado, are in a very good place.

As Buffett describes it, float is money that a company holds but does not own. It has all of the benefits of debt but none of the drawbacks; the most important consideration is the cost of capital – that is, how much money it costs the owners of a business to generate float. In exceptional cases, the cost can actually be negative; that is, you are paid to invest other people's money plus you get to keep the income from the investments. Other businesses can develop forms of float but it can be very difficult.

Notes

Sweat Equity

There is also a form of capital known as sweat equity which can be explained as equity acquired by a company's executives on favorable terms, to reflect the value the executives have added and will continue to add to the company. This type of equity results when an owner bootstraps operations by putting in long hours at a low rate of pay per hour making up for the lack of capital necessary to hire sufficient employees to do the job well and let them work an ordinarily forty hour workweek.

Although it is largely intangible and does not count as financial capital, it can be estimated as the cost of payroll saved as a result of excess hours worked by the owners. The hope is that the business will grow fast enough to compensate the owner for the low-pay, long-hour sweat equity infused into the enterprise.

Self Assessment

Fill in the blanks:

1. ..... is the invested money not repaid to the investors in the normal course of business.
2. Debt capital ranks ..... than equity capital for the repayment of annual returns.
3. ……..is largely intangible and does not count as financial capital, it can be estimated as the cost of payroll saved as a result of excess hours worked by the owners.

2.2 Operating Cycle

The extent to which profits can be earned will naturally depend, among other things, upon the magnitude of the sales. A successful sales programme is, in other words, necessary for earning profits by any business enterprise. However, sales do not convert into cash instantly: there is invariably a time-lag between the sale of goods and the receipt of cash. There is, therefore, a need for working capital in the form of current assets to deal with the problem arising out of the lack of immediate realisation of cash against goods sold. Therefore, sufficient working capital is necessary to sustain sales activity. Technically, this is referred to as the operating or cash cycle.

2.2.1 Meaning of Operating Cycle

The simplest definition of the term operating cycle is, "The average time between purchasing or acquiring inventory and receiving cash proceeds from its sale."

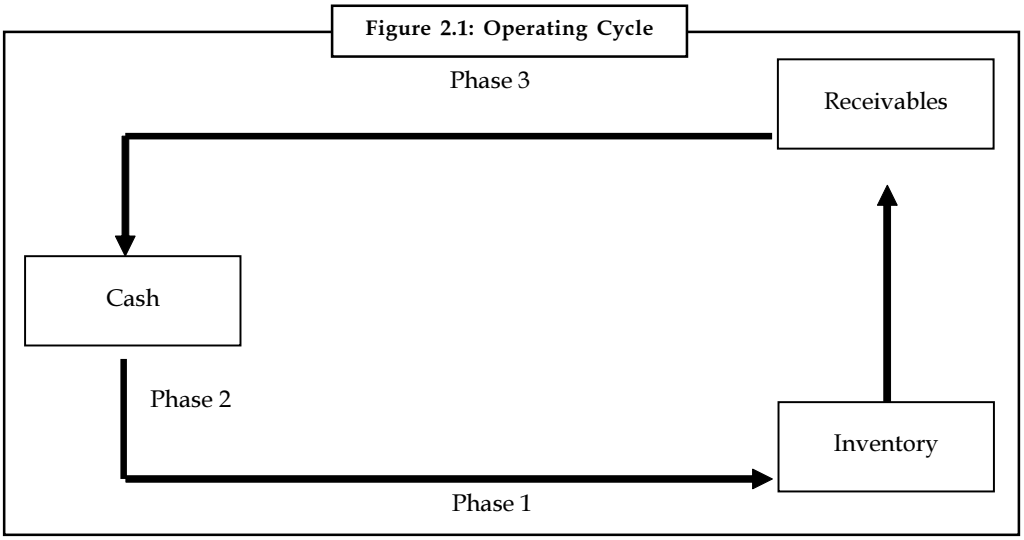
The operating cycle can be said to be at the heart of the need for working capital. The continuing flow from cash to suppliers, to inventory, to accounts receivable and back into cash is what is called the operating cycle. In other words, the term cash cycle refers to the length of time necessary to complete the following cycle of events:

1. Conversion of cash into inventory
2. Conversion of inventory into receivables
3. Conversion of receivables into cash.

The operating cycle, which is a continuous process, is shown in Figure 2.1.

Notes

Figure 2.1: Operating Cycle



If it were possible to complete the sequences instantaneously, there would be no need for current assets (working capital). But since it is not possible, the firm is forced to have current assets. Since cash inflows and outflows do not match, firms have to necessarily keep cash or invest in short-term liquid securities, so that they will be in a position to meet obligations when they become due. Similarly, firms must have adequate inventory to guard against the possibility of not being able to meet demand for their products. Adequate inventory, therefore, provides a cushion against being out of stock. If firms have to be competitive, they must sell goods to their customers on credit which necessitates the holding of accounts receivable. It is in these ways that an adequate level of working capital is absolutely necessary for smooth activity which, in turn, enhances the owner's wealth.

The operating cycle consists of three phases.

Phase I

In phase I, cash gets converted into inventory. This includes purchase of raw materials, conversion of raw materials into work-in-progress finished goods and finally the transfer of goods to stock at the end of the manufacturing process. In the case of trading organizations, this phase is shorter as there would be no manufacturing activity and cash is directly converted into inventory. The phase is, of course, totally absent in the case of service organisations.

Phase II

In phase II of the cycle, the inventory is converted into receivables as credit sales are made to customers. Firms which do not sell on credit obviously do not have phase II of the operating cycle.

Phase III

The last phase, phase III, represents the stage when receivables are collected. This phase completes the operating cycle. Thus, the firm has moved from cash to inventory, to receivables and to cash again.

Notes

2.2.2 Significance of Operating Cycle

The operating cycle is conceptually simple but critically important.

Example: Let's take the example of a greengrocer, who is ''cashing up'' one evening. What does he find? First, he sees how much he spent in cash at the wholesale market in the morning and then the cash proceeds from fruit and vegetable sales during the day. If we assume that the greengrocer sold all the produce he bought in the morning at a mark-up, the balance of receipts and payments for the day will deliver a cash surplus.

Unfortunately, things are usually more complicated in practice. Rarely is all the produce bought in the morning sold by the evening, especially in the case of a manufacturing business.

A company processes raw materials as part of an operating cycle, the length of which varies tremendously, from a day in the newspaper sector to 7 years in the cognac sector. There is thus a time lag between purchases of raw materials and the sale of the corresponding finished goods.

And this time lag is not the only complicating factor. It is unusual for companies to buy and sell in cash. Usually, their suppliers grant them extended payment periods, and they in turn grant their customers extended payment periods. The money received during the day does not necessarily come from sales made on the same day.

As a result of customer credit, supplier credit and the time it takes to manufacture and sell products or services, the operating cycle of each and every company spans a certain period, leading to timing differences between operating outflows and the corresponding operating inflows.

Each business has its own operating cycle of a certain length that, from a cash flow standpoint, may lead to positive or negative cash flows at different times. Operating outflows and inflows from different cycles are analysed by period, e.g., by month or by year. The balance of these flows is called operating cash flow. Operating cash flow reflects the cash flows generated by operations during a given period.

In concrete terms, operating cash flow represents the cash flow generated by the company's day-to-day operations. Returning to our initial example of an individual looking at his bank statement, it represents the difference between the receipts and normal outgoings, such as on food, electricity and car maintenance costs.

Naturally, unless there is a major timing difference caused by some unusual circumstances (start-up period of a business, very strong growth, very strong seasonal fluctuations), the balance of operating receipts and payments should be positive.

Self Assessment

Fill in the blanks:

4. The balance of operating receipts and payments is usually .....
5. There is a need for working capital in the form of ……to deal with the problem arising out of the lack of immediate realisation of cash against goods sold.
6. ……..is the average time between purchasing or acquiring inventory and receiving cash proceeds from its sale.

2.3 Cash Cycle

Cash conversion cycle expresses in days how long it takes a company to convert the materials it purchases into cash. By checking how many days inventory it holds, how long it takes to collect

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cash from customers and also considering how many days it can take to pay suppliers, it is possible to get an idea of how comfortable a company's cash flow position is.

2.3.1 Meaning of Cash Cycle

The cash cycle, also called the Cash Conversion Cycle (CCC), is a measure of the length of time it takes to get from paying cash for stock to getting cash after selling it. It is equal to:

Stock days + Debtor days – Creditor days

In other terms it may also be said that the Cash Cycle (CC) is a metric that expresses the length of time, in days, that it takes for a company to convert resource inputs into cash flows. The cash conversion cycle attempts to measure the amount of time each net input dollar is tied up in the production and sales process before it is converted into cash through sales to customers. This metric looks at the amount of time needed to sell inventory, the amount of time needed to collect receivables and the length of time the company is afforded to pay its bills without incurring penalties.

Cash Conversion Cycle is calculated as:

CCC = DIO + DSO – DPO

Where:

DIO represents days inventory outstanding

DSO represents days sales outstanding

DPO represents days payable outstanding

Let us understand each of these terms one by one.

DSO: It also represents accounts receivable turnover in days and measures the average number of days from the sale of goods to collection of resulting receivables. It is obtained by the following formula:

(Accounts Receivable/Sales × 365).

Example: A manufacturer of widgets: "Hilal Widget Co." with annual sales of ₹ 50,00,000 and with accounts receivable outstanding of ₹ 5,00,000 at the end of the year is said to have a 36.5 DIO.

= (₹ 5,00,000/₹ 50,00,000) × 365 = 36.5 days

DIO: It also represents inventory turnover and measures the length of time on average between acquisition and sale of merchandise. For a manufacturer it covers the amount of time between purchase of raw material and sale of the completed product. It is obtained by the following formula:

(Inventory/COGS × 365)

Example: Going back to our example of widget manufacturer "Hilal Widget Co.", let's suppose that the company had a COGS of ₹ 30,00,000 with inventory of ₹ 4,11,000 at the end of the year. It would be said that Hilal Widget Co. has inventory turnover days of 50.

(₹ 4,11,000/₹ 30,00,000) × 365 = 50 days

DPO: It also represents payables turnover in days and measures the average length of time between purchase of goods and payment for them. It is obtained by the following formula:

(Accounts Payable/COGS × 365)

Notes

Example: Continuing the same example, this time "Hilal Widgets Co." has an accounts payable balance of ₹ 4,56,000 at the end of the year. The result is an accounts payable days of 55.5

(₹ 4,56,000 / ₹ 30,00,000) x 365 = 55.5 days

In the case of Hilal Widget Co. the Cash Conversion Cycle is 31 days. (36.5 + 50 – 55.5)

2.3.2 Significance of Cash Cycle

This cycle is extremely important for retailers and similar businesses. This measure illustrates how quickly a company can convert its products into cash through sales. The shorter the cycle, the less time capital is tied up in the business process, and thus the better for the company's bottom line.

Cash Cycle is an important analysis tool that allows the credit analyst to determine more easily why and when the business needs more cash to operate, and when and how it will be able to repay the cash. It is also used to distinguish between the customer's stated loan purpose and the borrowing cause. Once the cash conversion cycle for the borrower is mapped, the analyst is able to judge whether the purpose, repayment source and structure of the loan are the adequate ones. Managing asset conversion in favor of the business owner is the ultimate goal of transportation logistics and techniques such as just in time inventory.

The length of the cash cycle dictates the amount of money that needs to be tied up in working capital proportionate to sales.

A shorter cash conversion cycle is better, other things being equal. It is possible for the cash conversion cycle to be negative, this is most likely for certain retailers who buy on credit, sell for cash and have a high stock turnover.

Example: Below is a numerical example of this calculation:

Year 1		Firm A
Inventory Processing Period (in Days)	+	90
Receivables Processing Period (in Days)	+	60
Payables Processing Period (in Days)	-	72
Cash Conversion Cycle		**78**

Year 2		Firm A
Inventory Processing Period (in Days)	+	82
Receivables Processing Period (in Days)	+	55
Payables Processing Period (in Days)	-	72
Cash Conversion Cycle		**65**

Year 3		Firm A
Inventory Processing Period (in Days)	+	82
Receivables Processing Period (in Days)	+	45
Payables Processing Period (in Days)	-	72
Cash Conversion Cycle		**55**

For demonstration purposes, we have steadily held the payables processing period at 72 days. It is clear from the above example that the firm's financial condition, from the perspective of the cash conversion cycle, has improved. Inventory processing and accounts receivable turnover has improved for firm A from year one to year three, implying that the processing period of each has declined.

Notes

Self Assessment

State whether the following statements are true or false:

7. The cash cycle is also called the Cash Conversion Cycle (CCC).
8. Day's sales outstanding represents payables turnover in days and measures the average length of time between purchase of goods and payment for them.
9. DPO represents accounts receivable turnover in days and measures the average number of days from the sale of goods to collection of resulting receivables.

2.4 Estimation of Working Capital Requirements

Working capital plays a very important role in day-to-day working of the business. If mistake is committed in estimating the working capital, it can create considerable difficulty for the management. In spite of having enough long-term capital, there are instances when companies have gone into liquidation due to non-availability of working capital. The finance manager has to be extra careful while estimating requirement of working capital for various time periods.

Thus the question of estimation of working capital requirement assumes great importance. The level of activity and the time period of production cycle are important. The credit allowed to debtors and credit available from creditors have also to be taken into account.

2.4.1 Determinants of Working Capital

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. These factors, however, 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 working capital requirements of an enterprise are basically related to the conduct of 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. The two relevant features are:

1. The cash nature of business, that is, cash sale, and
2. Sale of service rather than commodities.

In view of these features, they do not maintain big inventories and have, therefore, probably the least requirement of working capital. At the other extreme are trading and financial enterprises. The nature of their business is such that they have to maintain a sufficient amount of cash, inventories and book debts. They have necessarily to invest proportionately large amounts in working capital. The manufacturing enterprises fall, in a sense, between these two extremes. The industrial concerns require fairly large amounts of working capital though it varies from industry to industry depending on their asset structure. The proportion of current assets to total assets measures the relative requirements of working capital of various industries. Available data in respect of companies in India confirm the wide variations in the use of working capital by different enterprises. The percentage of current assets to total assets was found to be the lowest in hotels, restaurants and eating houses (10–20 per cent range), while in electricity generation and supply it was in the range of 20–30 per cent. The enterprises in the tobacco, construction and trading groups had, as is to be expected, the highest component of working capital (80–90 per cent range). The other industrial groups fall between these limits though there are very wide inter-industry variations.

Notes

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 the production of finished goods. Funds have to be necessarily tied up during the process of manufacture, necessitating enhanced working capital. In other words, there is some time 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 will be the tied-up funds and, therefore, the larger is the working capital needed and vice-versa. There are enterprises which, due to the nature of business, have a short operating cycle. A distillery, which has an ageing process, has generally to make a relatively heavy investment in inventory. The other extreme is provided by a bakery. The bakeries sell their products in short intervals and have a very high inventory turnover. The investment in inventory and, consequently, working capital is not very large.

Further, even within the same group of industries, the operating cycle may be different due to technological considerations. For economy in working capital, that process should be selected which has a shorter manufacturing process. Having selected a particular process of manufacture, steps should be taken to ensure that the cycle is completed in the expected time. This underlines the need for effective organisation and coordination at all levels of the enterprise. Appropriate policies concerning terms of credit for raw materials and other supplies can help in reducing working capital requirements. Often, companies manufacturing heavy machinery and equipment minimise the investment in inventory or working capital by requiring advance payment from customers as work proceeds against orders. Thus, a part of the financial burden relating to die manufacturing cycle time is passed on to others.

Business Cycle

The working capital requirements are also determined by the nature of the business cycle. Business fluctuations lead to cyclical 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:

1. Upward phase when boom conditions prevail, and
2. Downswing phase when the economic activity is marked by a decline.

During the upswing of business activity, the need for working capital is likely to grow to cover the lag between increased sales and receipt of cash as well as to finance purchases of additional material to cater to the expansion of the level of activity. Additional funds may lie required to invest in plant and machinery to meet the increased demand. The downswing phase of the business cycle has exactly an opposite effect on the level of working capital requirement. The decline in the economy is associated with a fall in the volume of sales which, in turn, leads to a fall in the level of inventories and book debts. The need for working capital in recessionary conditions is bound to decline. In brief, business fluctuations influence the size of working capital mainly through the effect on inventories. The response of inventory to business cycles is mild or violent according to nature of the business cycle.

Production Policy

The quantum of working capital is also determined by production policy. In case of certain lines of business, the demand for products is seasonal, that is, they are 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

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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 are serious production problems. During the slack season, the firms have to maintain their working force and physical facilities without adequate production and sale. When the peak period arrives, the firms have to operate at full capacity to meet the demand. This kind of arrangement would not only be expensive but also inconvenient. Thus, serious difficulties will be encountered in trying to match production to the ebb and flow of the seasonal demand pattern. A better alternative is a steady production policy independent of shifts in demand for the finished goods. This means a large accumulation of finished goods (inventories) during the off-season and their abrupt sale during the peak season. The progressive accumulation of stock naturally requires an increasing amount of working capital which remains tied up for some months. Working capital planning has to incorporate this pattern of requirement of funds when production and seasonal sales are steady. This strategy (steady production policy) is, however, not necessarily adopted by everyone. It may be possible, for instance, for some to follow a policy of diversification which enables them to engage the working force and the physical facilities in some other activity. If this is possible, there will be no major working capital problem. Moreover, the nature of some products may be such that accumulation of inventories may create special risk and cost problems. For them, a production policy in tune with the changing demands may be preferable. Therefore, production policies have to be formulated on the basis of the individual setting of each enterprise and the magnitude and dimension of the working capital problems will accordingly vary.

Caselet

Toyota's Global Competitive Advantage

Toyota's global competitive advantage is based on a corporate philosophy known as the Toyota Production System. This system is nothing but a very well defined production policy which covers not only the human resource but also its suppliers and components manufacturers.

Toyota Production System (TPS) includes principles like reduced setup times, small-lot production, employee involvement and empowerment, quality at the source, equipment maintenance, pull production, just-in-time production and supplies, supplier involvement, etc.

TPS in Toyota is mainly concerned with making a profit, and satisfying the customer with the highest possible quality at the lowest cost in the shortest lead-time, while developing the talents and skills of its workforce through rigorous improvement routines and problem solving disciplines. This results in higher and better production every year, and increased working capital to reinvest for the production planned for the next year.

Credit Policy

The credit policy relating to sales and purchases also affects the working capital. The credit policy influences the requirement of working capital in two ways:

1. Through credit terms granted by the firm to its customers/buyers of goods;
2. Credit terms available to the firm from its creditors.

The credit terms granted to customers have a bearing on the magnitude of working capital by determining the level of book debts. The credit sales result in higher book debts (receivables). Higher book debts mean more working capital. On the other hand, if liberal credit terms are available from the suppliers of goods (trade creditors), the need for working capital is less. The

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working capital requirements of a business are, thus, affected by the terms of purchase and sale, and the role given to credit by a company in its dealings with creditors and debtors.

The prevailing trade practices as well as changing economic conditions affect credit terms fixed by an enterprise. If, for example, competition is keen, there would be pressure to grant generous credit terms. Nevertheless, there is wide scope for managerial discretion in working out a suitable credit policy relevant to each customer based on the merits of each case. For instance, liberal credit facilities can be extended on the basis of credit rating. This will avoid the problem of having excess working capital. Similarly, the collection procedure can be so framed that funds, which would otherwise be available for meeting operating needs are not locked up. Thus, adoption of rationalised credit policies would be a significant factor in determining the working capital needs of an enterprise.

Such discretion may, however, not be available to a company which operates in a highly competitive market. To win and retain customers, it may be forced, among other things, to offer generous credit terms to them. The investment in book debts will consequently be of a higher order, necessitating large working capital in another way. To be able to enjoy consumer patronage on a continuous basis, a firm will have to offer a variety of products quite unlike a firm which has a hold on the market and, hence, does not need special efforts to satisfy customer requirements. The consequence of a higher level of inventories would be an additional need for working capital. The degree of competition is, therefore, an important factor influencing "working capital requirements".

Growth and Expansion

As a company grows, it is logical to expect that a larger amount of working capital is required. It is, of course, difficult to determine precisely the relationship between the growth in the volume of business of a company and the increase in its working capital. The composition of working capital in a growing company also shifts with economic circumstances and corporate practices. Other things being equal, growth industries require more working capital than those that are static. The critical fact, however, is that the need for increased working capital funds does not follow the growth in business activities but precedes it. Advance planning of working capital is, therefore, a continuing necessity for a growing concern. Or else, the company may have substantial earnings but little cash.

Vagaries in the Availability of Raw Material

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 of 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. The procurement of some essential raw materials is difficult because of their sporadic supply. This happens very often with raw materials which are in short supply and are controlled to ensure equitable distribution. The buyer has in such cases very limited options as to the quantum and timing of procurement. It may so happen that a bulk consignment may be available but the firm may be short of funds, while when surplus funds are available the commodities may be in short supply. This element of uncertainty would lead to a relatively high level of working capital. Finally, some raw materials may be available only during certain seasons. They would have to be necessarily obtained when available, to provide for a period when supplies are lean. This will cause seasonal fluctuations in working capital requirements.

Notes

Profit Level

The level of profits earned differs 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. A priori, it can be generalised that a firm dealing in a high quality product, having a good marketing arrangement and enjoying monopoly power in the market, is likely to earn high profits and vice-versa. Higher profit margin would improve the prospects of generating more internal funds thereby contributing to the working capital pool. 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 cannot be considered as cash available/or use at the end of cash cycle. Even as the company's operations are in progress, cash is used for augmenting stock, book debts and fixed assets. It must, therefore, be seen that cash generation has been used for furthering the interest of the enterprise. It is in this context that elaborate planning and projections of expected activities and the resulting cash inflows on a day-to-day, week-to-week and month-to-month basis assume importance because steps can then be taken to deal with surplus and deficit cash.

The availability of internal funds for working capital requirements is determined not merely by the profit margin but also by 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 leads 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 profits, working capital increases. 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 into account all the relevant factors.

There are wide variations in industry practices as regards the interrelationship between working capital requirements and dividend payment. In some cases, shortage of working capital has been a powerful reason for reducing or even skipping dividends in cash. There are occasions, on the other hand, when dividend payments are continued in spite of inadequate earnings in a particular year because of sound liquidity. Sometimes, the dilemma is resolved by the payment of bonus shares. This enables the payment of dividend without draining away the cash resources and, thus, without reducing working capital. Dividend policy, is thus, a significant element in determining the level of working capital in an organisation.

Notes

Price Level Changes

Changes in the price level also affect the requirements of working capital. Rising prices necessitate the use of funds for maintaining an existing level of activity. For the same level of current assets, higher cash outlays are required. The effect of rising prices is that a higher amount of working capital is needed. However, in the case of companies which can raise their prices proportionately, there is no serious problem working capital. Moreover, the price rise does not have a uniform effect on all commodities. It is likely that some firms may not be affected at all. In brief, the implications of changing price level on working capital position vary from company to company depending on the nature of its operations, its standing in the market and other relevant considerations.

Operating Efficiency

The operating of the management is also an important determinant of the level of working capital. The management can contribute to a sound working capital position through operating efficiency. Although the management cannot control the rise in prices, it can ensure the efficient utilisation of resources by eliminating waste, improving coordination, and a fuller utilisation of existing resources, and so on. Efficiency of operations accelerates the pace of cash cycle and improves the working capital turnover. It releases the pressure on working capital by improving profitability and improving the internal generation of funds.

To conclude, the level of working capital is determined by a wide variety of factors which are partly internal to the firm and partly external (environmental) to it. Efficient working capital management requires efficient planning and a constant review of the needs for an appropriate working capital strategy.

2.4.2 Computation of Working Capital

The two components of Working Capital (WC) are Current Assets (CA) and Current Liabilities (CL). They have a bearing on the cash operating cycle. In order to calculate the working capital needs, what is required is the holding period of various types of inventories, the credit collection period and the credit payment period. Working capital also depends on the budgeted level of activity in terms of production/sales. The calculation of WC is based on the assumption that the production/sales is carried on evenly throughout the year and all costs accrue similarly. As the working capital requirements are related to the cost excluding depreciation and not to the sale price, WC is computed with reference to cash cost. The cash cost approach is comprehensive and superior to the operating cycle approach based on holding period of debtors and inventories and payment period of creditors. Some problems have been solved, however, using the operating cycle approach also.

The steps involved in estimating the different items of CA and CL are as follows:

Estimation of Current Assets

Raw Materials Inventory: The investment in raw materials inventory is estimated on the

$$\frac{\text{Budgeted production (in units)} \times \text{Cost of raw materials per unit} \times \text{Average inventory holding period (months/days)}}{\text{12 months/365 days}}$$

Notes

Work-in-Process (W/P) Inventory: The relevant costs to determine work-in-process inventory are the proportionate share of cost of raw materials and conversion costs (labour and manufacturing overhead costs excluding depreciation). In case, full unit of raw material is required in the beginning, the unit cost of work-in-process would be higher, that is, cost of full unit + 50 per cent of conversion cost, compared to the raw material requirement throughout the production cycle; W/P is normally equivalent to 50 per cent of total cost of production. Symbolically,

$$\frac{\text{Budgeted production (in units)} \times \text{Estimated work-in-process cost per unit inventory} \times \text{Average time span or work-in-progress (months/days)}}{\text{12 months/365 days}}$$

Finished Goods Inventory: Working capital required to finance the finished goods inventory is given by factors summed up in 12 months/365 days

Debtors: The WC tied up in debtors should be estimated in relation to total cost price

$$\frac{\text{Budgeted Credit sales (in units)} \times \text{Cost of sales per unit (excluding depreciation)} \times \text{Average debt collection period (months/days)}}{\text{2 months/365 days}}$$

Cash and Bank Balances: Apart from WC needs for financing inventories and debtors, firms also find it useful to have some minimum cash balances with them. It is difficult to lay down the exact procedure of determining such an amount. This would primarily be based on the motives for holding cash balances of the business firm, attitude of management toward risk, the access to the borrowing sources in times of need and past experience, and so on.

Estimation of Current Liabilities

The working capital needs of business firms are lower to the extent where such needs are met through the current liabilities (other than bank credit) arising in the ordinary course of business. The important current liabilities, in this context are, trade-creditors, wages and overheads:

$$\frac{\text{Trade Creditors Budgeted yearly production (in units)} \times \text{Raw material cost per unit} \times \text{Credit period allowed by creditors (months/days)}}{\text{12 months/365 days}}$$

Notes Proportional adjustment should be made to cash purchases of raw materials.

Notes

$$\frac{\text{Direct Wages Budgeted yearly production (in units)} \times \text{Direct labour cost per unit} \times \text{Average time-lag in payment of wages (months/days)}}{\text{12 months/365 days}}$$

The average credit period for the payment of wages approximates to a half-a-month in the case of monthly wage payment. The first day's monthly wages are paid on the 30th day of the month, extending credit for 29 days, the second day's wages are, again, paid on the 30th, extending credit for 28 days, and so on. Average credit period approximates to half-a-month.

Overheads (Other than Depreciation and Amortisation)

$$\frac{\text{Budgeted yearly production (in units)} \times \text{Overhead cost per unit} \times \text{Average time-lag in payment of overheads}}{\text{12 months/365 days}}$$

The amount of overheads may be separately calculated for different types of overheads. In the case of selling overheads, the relevant item would be sales volume instead of production volume.

The computation of working capital is summarized in format.

1. ***Estimation of Current Asset: Amount:***
   - (a) Minimum desired cash and bank balances
   - (b) Inventories
     - Raw material
     - Work-in-process
     - Finished Goods
   - (c) Debtors
     - Total Current Assets
2. ***Estimation of Current Liabilities:***
   - (a) Creditors
   - (b) Wages
   - (c) Overheads

   Total Current Liabilities
3. ***Net Working Capital:***

   Add: Margin for contingency
4. ***Net Working Capital Required***

If payment is received in advance, the item would be listed in CL.

If advance payment is to be made to creditors, the item would appear under CA. The same would be the treatment for advance payment of wages and overheads.

Notes

Self Assessment

Fill in the blanks:

10. The term 'production or manufacturing cycle' refers to the ..... involved in the manufacture of goods.
11. Higher profit margin would ..... the prospects of generating more internal funds.
12. The calculation of WC is based on the assumption that the production/sales is carried on ..... throughout the year.
13. The relevant costs to determine work-in-process inventory are the ..... share of cost of raw materials and conversion costs.
14. The effect of rising prices is that a ..... amount of working capital is needed.
15. The working capital needs of business firms are lower where such needs are met through the .....
16. The payment of dividend ..... WC of a firm.

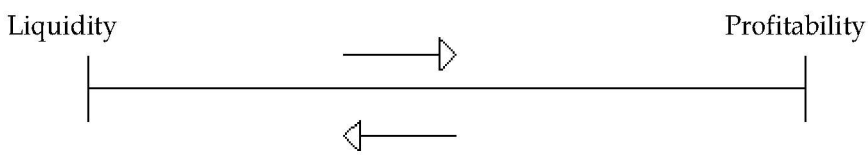
2.5 Liquidity and Profitability

There is a trade-off between liquidity and profitability; gaining more of one ordinarily means giving up some of the other.

Task Take a balance sheet of any company of your choice and determine the firms liquidity and profitability.

Liquidity means having enough money in the form of cash, or near-cash assets, to meet your financial obligations. Alternatively, it also signifies the ease with which assets can be converted into cash. Whereas profitability is a measure of the amount by which a company's revenues exceed its relevant expenses.

Figure 2.2: Liquidity and Profitability



Let us see picture "liquidity" as being on one end of a straight line and "profitability" on the other end of the line as in Figure 2.2. If we are on the line and move toward one, we automatically move away from the other. In other words, there is the trade-off between liquidity and profitability.

This is easy to illustrate with a simple example.

Example: The items on the asset side of a company's balance sheet are listed in order of liquidity, i.e., the ease with which they can be converted into cash, in order, the most important of these assets are:

Notes

1. Cash
2. Marketable Securities
3. Accounts Receivable
4. Inventory
5. Fixed Assets

Notes As we go from the top of the list to the bottom, the liquidity decreases. However, as we go from top to bottom, the profitability increases.

In other words, the most profitable investment for company is normally in its fixed assets; the least profitable investment is cash.

Self Assessment

State whether the following statements are true or false:

17. There is a trade-off between liquidity and profitability.
18. Profitability means having enough money in the form of cash, or near-cash assets, to meet your financial obligations.
19. Liquidity is a measure of the amount by which a company's revenues exceed its relevant expenses.
20. The most profitable investment for company is normally in its fixed assets; the least profitable investment is cash.

2.6 Summary

- The need for working capital (WC) arises from the cash/operating cycle of a firm.
- It refers to the length of time required to complete the following sequence of events: conversion of cash into inventory, inventory into receivables and receivables into cash.
- The operating cycle creates the need for working capital and its length in terms of time-span required to complete the cycle is the major determinant of the firm's working capital needs.
- Working capital requirements are determined by a variety of factors.
- These factors, however, affect different enterprises differently.
- In general, the factors relevant for proper assessment of the quantum of working capital required are: general nature of business, production cycle, business cycle, production policy, credit policy, growth and expansion, availability of raw materials, profit-level, level of taxes, dividend policy, depreciation policy, price level changes and operating efficiency.
- Manufacturing and trading enterprises require fairly large amounts of working capital to maintain a sufficient amount of cash, inventories and book debts to support their production and sales activity.
- Service enterprises and hotels, restaurants and eating houses need to carry less WC.
- The longer is the production cycle, the larger is the WC needed or vice versa.

Notes

- While the liberal credit policy offered to customers would necessitate more working capital tight credit terms would reduce its requirement.
- The liberal credit terms available from creditors/suppliers of materials would be an offsetting factor.
- The payment of dividend consumes cash resources and therefore, decreases WC of a firm. Conversely, the non-payment of dividend increases WC.
- Working capital requirements are to be computed with reference to cash costs and not the sale price as depreciation is a non-cash cost and, hence, does not need WC.
- The investment required to finance debtors are at cost price.

2.7 Keywords

Bond: An instrument for long-term debt.

Circulating Capital: Working capital is also known as circulating capital.

Current Assets: Current assets are the assets, which can be converted into cash within an accounting year or operating cycle.

Debt Capital: Debt capital is the capital that a business raises by taking out a loan.

DIO: Days Inventory Outstanding

DPO: Days Payable Outstanding

DSO: Days Sales Outstanding

Equity Capital: Equity capital can be understood as the invested money that is not repaid to the investors in the normal course of business.

Gross Working Capital: It refers to the firm's investment in Current Assets.

Net Working Capital: This is the excess of Current Asset over Current liabilities.

Sweat Equity: There is also a form of capital known as sweat equity which can be explained as equity acquired by a company's executives on favorable terms, to reflect the value the executives have added and will continue to add to the company.

2.8 Review Questions

1. X & Y Ltd. is desirous to purchase a business and has consulted you, and one point on which you are asked to advise them, is the average amount of working capital which will be required in the first year's working.

   You are given the following estimates and are instructed to add 10 per cent to your computed figure to allow for contingencies.

Particulars	Amount for the year
Average amount backed up for stocks:	
Stocks of finished product	5,000
Stocks of stores and materials	8,000
Average credit given:	
Inland sales, 6 weeks' credit	3,12,000
Export sales, 1.5 weeks' credit	78,000

Contd...

Notes

Average time lag in payment of wages and other outgoings:	
Wages 1.5 weeks	
Stocks and materials, 1.5 months	2,60,000
Rent and royalties, 6 months	48,000
Clerical staff, 0.5 month	10,000
Manager, 0.5 month	62,000
Miscellaneous expenses,	4,800
1.5 months	48,000
Payment in advance:	
Sundry expenses (paid quarterly in advance)	
Undrawn profits on an average	8,000
through out the year	11,000

2. Pro forma cost sheet of a company provides the following particulars:

Particulars	Amount per unit (₹)
Elements of cost:	
Raw materials	80
Direct labour	30
Overhead	60
Total cost	170
Profit	30
Selling price	200

The following further particulars are available:

Raw materials in stock, on average, one month; Materials in process (completion stage, 50 per cent), on average, half a month; Finished goods in stock, on average, one month.

Credit allowed by suppliers is one month; Credit allowed to debtors is two months; Average time-lag in payment of wages is 1.5 weeks and one month in overhead expenses; one-fourth of the output is sold against cash; cash in hand and at bank is desired to be maintained at ₹ 3,65,000.

You are required to prepare a statement showing the working capital needed to finance a levels of activity of 1,04,000 units of production. You may assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. For calculation purposes, 4 weeks may be taken as equivalent to a month.

3. How that it is possible for a company to go bankrupt if it has a lot of cash but is not profitable?

4. How would you analyze a firm's liquidity, profitability, long-term solvency, cash flow adequacy and market strength? List the ratio name and the related computing formula.

5. Do you think that liquidity more important than profitability in the short-term of a new business? Why/why not?

6. As a financial manager, what factors would you consider while estimating working capital requirements of a firm?

Notes

7. What methods do you suggest for estimating working capital needs?
8. Company A is having operating cycle of 15 days, B is having an operating cycle of 10 days which company is having better position and why?
9. What recommendations would you make to improve the operating cycle of a company?
10. In your opinion, what would decrease the length of the cash cycle?

Answers: Self Assessment

1.	Equity capital	2.	Higher
3.	Sweat Equity	4.	Positive
5.	Current assets	6.	Operating cycle
7.	True	8.	False
9.	False	10.	Time
11.	Improve	12.	Evenly
13.	Proportionate	14.	Higher
15.	Current liabilities	16.	Larger
17.	True	18.	False
19.	False	20.	True

2.9 Further Readings

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Notes

Unit 3: Financing of Working Capital Needs

CONTENTS

Objectives

After studying this unit, you will be able to:

- Identify the sources of working capital
- Discuss the commercial banks and commercial papers
- Explain the factoring and trade credit
- Describe the accrued expenses and deferred income

Introduction

Once, estimation of working capital required is completed, then the next step is financing of working capital. Statement of working capital gives clear picture about the components, (raw materials, work-in-process, finished goods and receivables) and required investment in these components of working capital. Generally investment in these components varies a great deal during the course of the year. Financing of current assets is the responsibility of finance manager who may require spending lot of time for raising finance.

3.1 Sources of Working Capital

Working capital should be financed by suitable and optimal mix of short-term source of funds and long-term source of funds.

Notes

3.1.1 Commercial Banks

Commercial banks are the major source of working capital finance to industries and commerce. Granting loan to business is one of their primary functions. Getting bank loan is not an easy task since the lending bank office may ask number of questions about the prospective borrower's financial position and its plans for the future. At the same time bank will want to monitor of the borrower's business progress. But there is a good side to this that is borrower's share price tends to rise, because investor know that convince banks is very difficult.

Forms of Bank Finance

Banks provide different types of tailored made loans that are suitable for specific needs of a firm. The different types of forms of loans are:

1. Loans
2. Overdrafts
3. Cash credits
4. Purchase or discounting of bills and
5. Letter of Credit
6. Bank Guarantee.

1. ***Loans:*** Loan is an advance – a sum given to borrower against some security. Loan amount is paid to the applicant in the form of cash or by credit to his/her account. In practice the loan amount is paid to the customer by crediting his/her account. Interest will be charged on the entire loan amount from the date the loan is sanctioned. Borrower can repay the loan either in lump sum or in installments depending on conditions.

Notes If the loan is repayable in installment basis, interest will be calculated on quarterly and on reduced balances. Generally, working capital loans will be granted for one-year period.

2. ***Overdrafts:*** Overdraft facility is an agreement between the borrower and the banker, where the borrower is allowed to withdraw funds in excess of the balance in his/her current accounts up to a certain limit during a specified period. It is flexible from the borrower's point of view because the borrower can withdraw and repay the cash whenever he/she wants within the given stipulations. Interest is charged on daily drawn balances and not on the overdraft limit given by the bank. But bank charges some minimum charges.

3. ***Cash Credit:*** It is the most popular source of working capital finance in India. A cash credit facility is an arrangement where a bank permits a borrower to withdraw money up to a sanctioned credit limit against tangible security or guarantees. Borrower does not require withdrawing the total sanctioned credit at a time, rather, he can withdraw according to his/her requirements and he can also repay the surplus cash in his cash credit account. Interest is chargeable on actually used amount and there is no commitment charge. Cash credit is a flexible source of working capital from borrower's point of view.

4. ***Purchasing or Discounting of Bills:*** Bills receivable arises out of sales transaction, where the seller of goods draws the bill on the purchaser. The bill may be documentary or clean bill. Once the bill is accepted by the purchaser, then the drawer (seller) of the bill can go to bank for discount or sale. The credit worthiness of the drawer (seller) is satisfactory, then

Notes

bank purchases or discounts the bill and reduces funds by way of crediting to customers account. The credited amount will be less than the bill amount. At the end of the maturity period of the bill, bank presents the bill to drawer (acceptor) for payment.

Caution If the bill is discounted and dishonored by the drawer, then the customer (seller) is liable to pay the bill amount and any other expenses incurred to bank.

5. ***Letter of Credit [L/C]:*** There are two non-hind based sources of working capital, viz., letter of credits (L/Cs) and Bank Guarantees (B/Gs). These are also known as quasi-credit facilities, due to non-payment of amount immediately. A Letter of Credit (L/C) is a written document issued by the Buyer's Banker (BB) at the request of the buyer, in favour of the seller, where by the Buyer Banker gives an undertaking to the seller, that the bank pay the obligations of its customer up to a specified amount, if the customer fails to pay the value of goods purchased. It helps to bank's customer to obtain credit from the seller (supplier), which is possible by assurance of the payment. Thereby, it allows the supplier to extend credit, since the risk of non-payment is transferred to the BB. Letter of credit facility is available from bank only for the companies that are financially sound and Bank charges the customer for providing this facility.

6. ***Bank Guarantee:*** A bank guarantee is a written contract given by a bank on the behalf of a customer. By issuing this guarantee, a bank takes responsibility for payment of a sum of money in case, if it is not paid by the customer on whose behalf the guarantee has been issued. In return, a bank gets some commission for issuing the guarantee. Bank offers guarantee in the form of Bid security, Performance security (< 5 yrs), Advance security & financial security.

Caselet

Mahanagar Garments becomes Mahanagar Exports

Bank of Baroda (BOB) offers corporations working capital finance to meet their operating expenses, purchasing inventory, receivables financing, either by direct funding or by issuing letter of credit. The use of this opportunity was quite smartly made by Mahanagar garments that used to be a small garment manufacturing firm in Kanpur, UP.

The owner, Mr Kamal Bajaj required a bigger amount of working capital so as to venture into foreign markets. He got to know about BOB's funded facilities (funding and assistance to actually purchase business assets or to meet business expenses) and non-funded facilities (the bank can issue letters of credit or can give a guarantee on behalf of the customer to the suppliers, Government Departments for the procurement of goods and services on credit).

He approached the bank authorities, got adequate and timely finance, and converted his firm from a small garment manufacturing unit into an export house.

Source: business.gov.in

Self Assessment

Fill in the blanks:

1. ..... of current assets is the responsibility of finance manager.
2. ..... are the major source of working capital finance to industry and commerce.

Notes

3. ..... is a sum given to borrower against some security.
4. In ..... facility, the borrower is allowed to withdraw funds in excess of the balance in his/her current accounts.

3.1.2 Commercial Papers (CPs)

Commercial paper represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating. It was first introduced in USA and it was an important money market instruments. In India, Reserve Bank of India introduced CP on the recommendations of the Vaghul Working Group on money market. CP is a source of short-term finance to only large firms with sound financial position.

Features of CP

CP can be issued for maturities between a minimum of 7 days and a maximum of up to one year from the date of issue. The maturity date of the CP should not go beyond the date up to which the credit rating of the issuer is valid. CP can be issued in denominations of ₹ 5 lakh or multiples thereof. Amount invested by a single investor should not be less than ₹ 5 lakh (face value). CP can be issued either in the form of a promissory note or in a dematerialised form through any of the depositories approved by and registered with SEBI. CP will be issued at a discount to face value as may be determined by the issuer. No issuer shall have the issue of CP underwritten or co-accepted.

Eligible Issuers of CP

1. Corporates, PDs (primary dealers) and all-India Financial Institutions (FIs) that have been permitted to raise short-term resources under the umbrella limit fixed by the Reserve Bank of India (RBI) are eligible to issue CP.
2. A corporate would be eligible to issue CP provided: (a) the tangible net worth of the company, as per the latest audited balance sheet, is not less than ₹ 4 crore; (b) the company has been sanctioned working capital limit by bank/s or FIs; and (c) the borrowal account of the company is classified as a Standard Asset by the financing bank/institution.

Advantages of CP

1. It is an alternative source of finance and proves to be helpful during the period of tight bank credit.
2. It is a cheaper source of short-term finance when compared to the bank credit.

Task Analyse and discuss the possible disadvantages of CPs.

3.1.3 Factoring

Banks have been given more freedom of borrowing and lending both internally and externally, and facilitated the free functioning of the banks in lending and investment operations. From 1994 banks are allowed to enter directly leasing, hire purchasing and factoring services, instead through their subsidiaries. In other words, Banks are free to enter or exit in any field depending on their profitability, but subject to some RBI guidelines.

Notes

Banks provide working capital finance through financing receivables. A "Factor" is a financial institution, which renders services relating to the management and financing of sundry debtors that arises from credit sales. Factoring is a popular mechanism of managing, financing and collecting receivables in developed countries like USA and UK, and it has spread over to a number of countries in recent past including India. In India, factoring service started in April 1994, after setting up of subsidiaries. It is yet at the formative stage. In India, there are only four public sector banks that offer factoring related service in the respective regions of the country (authorized by RBI) viz., State Bank of India {subsidiary State Bank of India Factoring and Commercial Services Limited), Canara Bank (Canara Bank Factoring Limited), Allahabad Bank and Punjab National Bank to cater to the needs of the Western, Southern, Eastern and Northern regions, respectively.

Self Assessment

Fill in the blanks:

5. By reducing the size of its ..... , more money is made available for investment in the firm's growth.
6. A ..... is a financial institution, which renders services relating to the management and financing of sundry debtors that arises from credit sales.
7. Commercial Paper is an unsecured .....

3.1.4 Trade Credit

Trade credit refers to the credit extended by the supplier of goods or services to his/her customer in the normal course of business. Trade credit occupies very important position in short-term financing due to the competition. Almost all the traders and manufacturers are required to extend credit facility (a portion), without which there is no possibility of staying back in the business. Trade credit is a spontaneous source of finance that arises in the normal business transactions of the firm without specific negotiations (automatic source of finance). In order to get this source of finance, the buyer should have acceptable and dependable credit worthiness and reputation in the market. Trade credit generally extended in the format open account or bills of exchange. Open account is the form of trade credit, where supplier sends goods to the buyer for the payment to be received in future as per terms of the sales invoice. As such trade credit constitutes a very important source of finance; it represents 25 per cent to 50 per cent of the total short-term sources for financing working capital requirements.

Getting trade credit may be easy to the well-established or well-reputed firm, but for a new or the firm with financial problems will generally face problem in getting trade credit. Generally suppliers look for earning record, liquidity position and payment record which is extending credit. Building confidence in suppliers is possible only when the buyer discussing his/her financial condition future plans and payment record. Trade credit involves some benefits and costs.

Advantages of Trade Credit

The main advantages are:

1. Easy availability when compared to other sources of finance (except financially weak companies).
2. Flexibility is another benefit, as the credit increases with the growth of the firm's sales.
3. Informality as we have already seen that it is an automatic finance.

Notes

The above discussion on trade credit reveals two things. One, cost of trade credit is very-high beyond the cash discount period, company should not have cash discount for prompt payment and Second, if the company is not able to avail cash discount it should pay only at the end of last day of credit period, even if it can delay by one or two days, it does not affect the credit standing.

3.1.5 Accrued Expenses

Accrued expenses are those expenses which the company owes to the other persons or organisations, but not yet due and not yet paid the amount. In other words, accruals represent a liability that a firm has to pay for the services or goods, which it has already received. It is spontaneous and interest-free sources of financing.

Example: 1. Interest that has accrued on an outstanding note that has not been paid and taxes that have accrued but not yet been paid. Interest is paid periodically in the year but the funds are used continuously by a firm.

2. Salaries, wages, interest and taxes are the major constituents of accruals. Salaries and wages are usually paid on monthly and weekly basis respectively. The amounts of salaries and wages have owed but not yet paid and shown them as accrued salaries and wages on the balance sheet at the end of financial year. Longer the time lag in payment of these expenses, the greater is the amount of funds provided by the employees.

3. Similarly, tax is another accrual, as source of short-term finance. Tax will be paid on earnings. Income tax is paid to the government on quarterly basis and some other taxes may be payable half-yearly or annually. Amount of taxes due as on the date of the balance sheet but not paid till then and they are showed as accrued taxes on the balance sheet.

Notes All other such items of expenses can be used as a source of short-term finance but shown on the balance sheet.

The amount of accrual varies with the level of activities of a firm. When the level of activity expands, accruals increase, they automatically act as a source of finance, and Accruals are treated as "cost free" source or finance, since it does not involve any payment of interest. But in actual terms, it may not be true, since payment of salaries and wages is determined by provisions of law and industry practice, similarly, tax payment governed by laws and delay in payment of tax leads to pay penalty. Hence, a firm must be noted that use of accruals as a source of working capital or it may not be possible to delay in payment of these items of expenses.

Importance of Accrued Expenses

The goal of every accountant is to present fairly the financial statements of the business. If there are expenses that have been occurred and they are not reflected at period end, the statements will not be accurate.

Management, outside investors and regulators depend on the accuracy of statements in order to make decisions. In the case above, if management is unaware that the consulting expense is not included, they may make incorrect decisions on how much money they have to spend on supplies, or maybe bonuses.

Notes

3.1.6 Deferred Income

Deferred income is the converse of accruals. It is income received during an accounting period, but for which the company has not yet supplied the goods and services as at the end of the period, so which cannot be recognised as income. These amounts should not be included in the Profit & Loss for the period.

An item that gives rise to deferred income is the other side of a prepayment. Where a buyer has a prepayment, its supplier will have deferred income.

Notes Accruals and deferred income are often shown as a single balance sheet item. Some companies disclose them separately, which is useful for financial modelling, because it makes future revenues more visible.

Deferred incomes are incomes received in advance by the firm for supply of goods or services in future period. These income receipts increase the firm's liquidity and constitute an important source of short-term source finance. These payments are not showed as revenue till the supply of goods or services, but showed in the balance sheet as income received in advance. Advance payment can be demanded by only firms having monopoly power, great demand for its products and services and if the firm is manufacturing a special product on a special order.

Case Study

Essel Corporation

Essel Corporation is seeking to raise short-term funds by factoring receivables. It has talked with two factors and is trying to decide which factor to use. Factor A charges 3.5 per cent factoring commission on gross invoices. Interest rate is 1 per cent per month on the gross invoice amount. Factor A requires that 5 per cent of the gross invoice amount be placed in a reserve until the account has paid. Factoring would be with recourse. Factor B charges 4.0 per cent factoring commission on the gross invoice amount and 1.0 per cent per month interest on the invoice amount less factoring commissions and reserve (which is 5 per cent of the invoice amount). Factoring is without recourse.

1. Assume that Essel wants to immediately factor ₹ 1,00,000 in receivables and borrow the maximum amount allowed. What is the amount of the loan it will receive from factor A and Factor B? You may assume that the receivables to be factored will average a collection period of one month.
2. Essel wishes to enter into a continuous long-term factoring arrangement with either factor A or factor B. What does it need to consider before selecting A or B? Should Essel give its business to A or B? Support your answer with illustrations/examples.

Self Assessment

Fill in the blanks:

8. The goal of every accountant is to present fairly the ..... of the business.
9. The main advantages of trade credit are ..... , ... and .....
10. The amount of accrual varies with the level of ..... of a firm.

Notes

3.2 Summary

- Estimation of working capital required is completed, then the next step is financing of working capital.
- Statement of working capital gives clear picture about the components and required investment in these components of working capital.
- Working capital should be financed by suitable and optimal mix of short-term source of funds and long-term source of funds.
- Main sources of financing funds are trade credit, accruals, differed incomes, commercial papers and commercial banks.
- Trade credit refers to the credit extended by the supplier of goods or services to his customer in the normal course of business.
- Trade credit is a spontaneous source of finance that it arises in the normal business transactions of the firm without specific negotiations (automatic source of finance).
- Accrued expenses are those expenses which the company owes to the other persons or organisations, but not yet due to pay the amount.
- Deferred Incomes are income received in advance by the firm for supply of goods or services in future period.
- Commercial Papers represents a short-term unsecured promissory notes issued by firms that have a fairly high credit (standing) rating.
- Commercial Paper is an alternative source of finance and proves to be helpful during the period of tight bank credit, it is a cheaper source of short-term finance when compared to the bank credit.
- Commercial banks are the major source of working capital finance and loaning of funds to business is one of their primary functions.
- Forms of bank finance are loans, overdrafts, cash credits, purchase or discounting of bills and letter of credit.
- Factoring service may be offered to the client in two ways: (a) with recourse to the drawer(s) and (b) without recourse to the drawer(s).

3.3 Keywords

Accounts Receivable: Money owed to a firm by its suppliers.

Acid Test Ratio: A liquidity measure which is defined as current liabilities.

Commercial Papers (CPs): Commercial paper represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating.

Loans: Loan is an advance – a sum given to borrower against some security.

Overdrafts: Overdraft facility is an agreement between the borrower and the banker, where the borrower is allowed to withdraw funds in excess of the balance in his/her current accounts up to a certain limit during a specified period.

Trade Credit: Trade credit refers to the credit extended by the supplier of goods or services to his/her customer in the normal course of business.

Notes

3.4 Review Questions

1. If a firm has accrued expenses, it should definitely have some unaccrued expenses. Give examples and discuss the significance of such unaccrued expenses.
2. Prove that the deferred incomes increase a firm's liquidity.
3. A buyer has a prepayment. What does it show and why?
4. Evaluate the role of commercial banks in industrial finance in India.
5. Why are letter of credits (L/Cs) and bank guarantees (B/Gs) known as quasi-credit facilities?
6. Analyse and list at least three advantages and three disadvantages of overdraft facility.
7. In your opinion, why it might be difficult for a new firm to get trade credit?
8. Critically evaluate the importance of accrued expenses.
9. What is the significance of commercial papers in economies like India?
10. Should the deferred payment be included in Profit & Loss of a firm? Why/why not?

Answers: Self Assessment

1.	Financing	2.	Commercial banks
3.	Loan	4.	Overdraft
5.	Cash balances	6.	Factor
7.	Promissory note	8.	Financial statements
9.	Easy availability, flexibility, informality	10.	Activities

3.5 Further Readings

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Notes

Unit 4: The Financing Mix

CONTENTS

Objectives

After studying this unit, you will be able to:

- Discuss the approaches to determine an appropriate financing mix
- Explain the working capital and banking policy
- Discuss recommendations of Dahejia Committee, Tandon Committee, Chore Committee, Marathe Committee and Kannan Committee
- Explain the MPBF Norms

Introduction

The net working capital position of the firm is an important consideration, as this will determine the firm's profitability and risk. Here the profitability refers to profits after expenses and risk refers to the probability that a firm will become technically insolvent where it will be unable to meet obligations when they become due for payment.

A finance manager has to make an appropriate financing mix, which will limit the risk and increase the profitability. Financing mix refers to the proportion of current assets financed by current liabilities and long-term funds.

Notes

4.1 Approaches to Determine an Appropriate Financing Mix

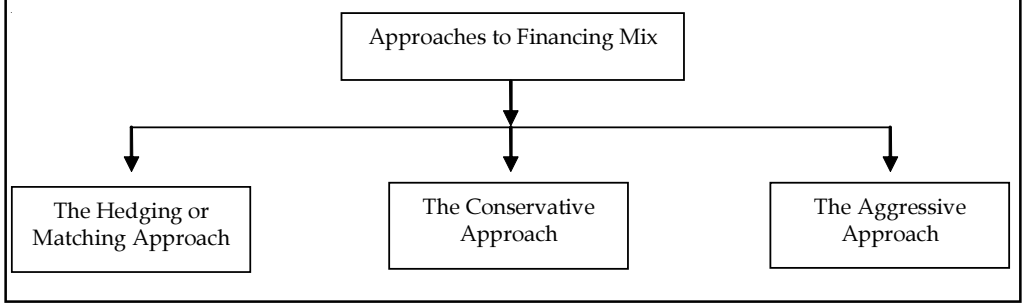
One of the most important decisions to be involved in the management of working capital is determining the financing mix.

Broadly speaking, there are two sources of financing working capital requirements:

1. Long-term sources such as share capital, debentures, public deposits, ploughing back of profits, loans from financial institutions, and
2. Short-term sources such as commercial banks, indigenous bankers, trade credits, installment credit, advances, account receivables and so on. Therefore, a question arises as to what portion of working capital (current assets) should be financed by long-term sources and how much by short-term sources?

There are three basic approaches for determining an appropriate working capital financing mix.

Figure 4.1: Basic Approaches to Financing Mix



4.1.1 Hedging or Matching Approach

The term 'hedging' usually refers to two off-selling transactions of a simultaneous but opposite nature which counterbalance the effect of each other. With reference to financing mix, the term hedging refers to 'a process of matching maturities of debt with the maturities of financial needs'. According to this approach, the maturity of sources of funds should match the nature of assets to be financed. This approach is, therefore, also known as 'matching approach'. This approach classifies the requirements of total working capital into two categories:

1. Permanent or fixed working capital which is the minimum amount required to carry out the normal business operations. It does not vary over time.
2. Temporary or seasonal working capital which is required to meet special exigencies. It fluctuates over time.

The hedging approach suggests that the permanent working capital requirements should be financed with funds from long-term sources while the temporary or seasonal working capital requirements should be financed with short-term funds.

Notes

Example: The following example explains this approach.

Estimated Total Investment in Current Assets of Company X for the Year 2000

Month	Investments in Current Assets (₹)	Permanent or Fixed Investments (₹)	Temporary or Seasonal Investment (₹)
January	50,400	45,000	5,400
February	50,000	45,000	5,000
March	48,700	45,000	3,700
April	48,000	45,000	3,000
May	46,000	45,000	1,000
June	45,000	45,000	-------
July	47,500	45,000	2,500
August	48,000	45,000	3,000
September	49,500	45,000	4,500
October	50,700	45,000	5,700
November	52,000	45,000	7,000
December	48,500	45,000	3,500
		Total	44,300

According to hedging approach the permanent portion of current assets required (₹ 45,000) should be financed with long-term sources and temporary or seasonal requirements in different months (₹ 5,400; ₹ 5,000 and so on) should be financed from short-term sources.

4.1.2 Conservative Approach

This approach suggests that the entire estimated investments in current assets should be financed from long-term sources and the short-term sources should be used only for emergency requirements. According to this approach, the entire estimated requirements of ₹ 52,000 in the month of November (in the above given example) will be financed from long-term sources. The short-term sources. The short-term funds will be used only to meet emergencies. The distinct features of this approach are:

1. Liquidity is severally greater;
2. Risk is minimized; and
3. The cost of financing is relatively more as interest has to be paid even on seasonal requirements for the entire period.

Did u know? **What is trade-off between the hedging and conservative approaches?**

The hedging approach implies low cost, high profit and high risk while the conservative approach leads to high cost, low profits and low risk. Both the approaches are the two extremes and neither of them serves the purpose of efficient working capital management. A trade off between the two will then be an acceptable approach. The level of trade off may differ from case to case depending upon the perception of risk by the persons involved in financial decision-making. However, one way of determining the trade off is by finding the average of maximum and the minimum requirements of current assets or working

Notes

capital. The average requirements so calculated may be financed out of long-term funds and the excess over the average from the short-term funds.

Thus, in the above given example the average requirements of ₹ 48,500, i.e. may be financed from long-term while the excess capital required during various months from short-term sources.

4.1.3 Aggressive Approach

The aggressive approach suggests that the entire estimated requirements of currents asset should be financed from short-term sources and even apart of fixed assets investments be financed from short-term sources. This approach makes the finance-mix more risky, less costly and more profitable.

Example: 1. Excel Industries Ltd. is considering its current assets policy. Fixed assets are estimated at ₹ 40, 00,000 and the firm plans to maintain a 50 percent debt to asset ratio. The interest rate is 14 percent on all debt. Three alternative current asset policies are under consideration; 40, 50 and 60 percent of projected sales. The company expects to earn 50 percent before interest and tax on sales of ₹ 2,00,00,000. The corporate tax rate is 35 percent. Calculate the expected return on equity under alternative.

Alternative Balance Sheets of Excel Industries Ltd.

	Current Assets Policies		
	Conservative (40% of Sales) ₹ (in lacs)	**Moderate (50% of Sales) ₹ (in lacs)**	**Aggressive (60% of Sales) ₹ (in lacs)**
Current Assets	80.00	100.00	120.00
Fixed Assets	40.00	40.00	40.00
Total Assets	120.00	140.00	160.00
Debt (50% of Total Assets)	60.00	70.00	80.00
Equity	60.00	70.00	80.00
Total Liabilities and Equity	120.00	140.00	160.00

Alternative Income Statements: Effects of Alternative Current Assets Policies

	Current Assets Policies		
	Conservative (40%), ₹ (in lacs)	**Moderate (50%) ₹ (in lacs)**	**Aggressive (60%) ₹ (in lacs)**
Sales	200.00	200.00	200.00
Earnings before Interest and Tax (20%)	40.00	40.00	40.00
Interest on Debt (14%)	8.40	9.80	11.20
Earnings before Tax (EBT)	31.60	30.20	28.80
Tax (35%)	11.06	10.57	10.08
Earnings after Tax (EAT)	20.54	19.63	18.72
Return on Equity (EAT/Equity)	34.23%	28.04%	23.40%

Notes

2. The following are the summarized balance sheets of X Ltd. and Y Ltd. as on 31st March, 2003:

	X Ltd. (₹ in lacs)	Y Ltd. (₹ in lacs)
Current Assets	100.00	60.00
Fixed Assets	100.00	140.00
Total Assets	200.00	200.00
Current Liabilities	20.00	80.00
Long-term Debt	80.00	20.00
Equity Share Capital	70.00	30.00
Retained Earnings	30.00	70.00
	200.00	200.00

Earnings before interest and tax for both the companies are ₹ 50 lacs each. The corporate tax rate is 35 percent.

(a) What is the return on equity (ROE) for each company if the interest rate on current liabilities is 10 per cent and 12 per cent on long-term debt?

(b) Assuming that the rate of interest on current liabilities rises to 15 percent, while it remains unchanged for ling-term debt, would be its effect on return on equity for each company?

Solution:

Calculation of Return on Equity

(₹ in lacs)

	X Ltd.		Y Ltd.	
	(a)	(b)	(a)	(b)
Earnings Before Interest and Tax	50.00	50.00	50.00	50.00
Interest on Current and Long-term Debt	11.60	12.60	10.40	14.40
Earnings Before Tax (EBT)	38.40	37.40	39.60	35.60
Tax (35%)	13.44	13.09	13.86	12.46
Earnings After Tax (EAT)	24.96	24.31	25.74	23.14
Equity (Eq. Share Capital+Retained Earnings)	100.00	100.00	100.00	100.00
Return on Equity (EAT/Equity)	24.96%	24.31%	25.74%	23.14%

Notes

Self Assessment

Fill in the blanks:

1. The ..... approach suggests that the entire estimated investments in current assets should be financed from long-term sources.
2. ……..refers to two off-selling transactions of a simultaneous but opposite nature which counterbalance the effect of each other.
3. The hedging approach implies low cost, high profit and high risk while the conservative approach leads to high cost, …….and……...

4.2 Working Capital and Banking Policy

Banks have been following certain norms in granting working capital finance to companies. These norms have been greatly influenced by the recommendations of various committees appointed by the Reserve Bank of India from time to time. The norms of working capital finance followed by bank since mid-70 were mainly based on the recommendations of the Tandon Committee. The Chore Committee made further recommendations to strengthen the procedures and norms for working capital finance by banks. The norms based on the recommendations of these committees are discussed below. In the deregulated economic environment in India recently, banks have considerably relaxed their criteria of lending. In fact, each bank can develop its own criteria for the working capital finance.

A study group, popularly known as the Tandon Committee, was appointed by the Reserve Bank of India in July 1974 to suggest guidelines for the rational allocation and optimum use of bank credit. This was done on the presumption that the existing system of bank lending had a number of weaknesses.

Notes The existing system has served its primary objective of financing trade quite efficiently in the past, when the industrial structure was simple. Industries in India, however, grew rapidly in the last three decades and, as a result, the industrial system became very complex. One can also witness a shift in the bank's role from trade financing to industrial financing during this period. But the commercial bank's lending practices and style remained almost the same.

Because of the easy availability of bank credit, industries in the past did not use it properly arid efficiently. Still today industries are not using banks funds skillfully and for appropriate purposes. A majority of the companies in India are not cash, or resource, conscious; their techniques of managing funds at times, are unscientific and non-professional. A number of companies, even among the largest industrial units, have yet to learn the methods of reducing costs, optimising use of inputs per unit of output, conserving resources, improving and developing product, orienting their marketing practices and policies to customers and so on. If they fail in using these techniques of modem management, industries in the country may become a national burden. Already a number of units have become sick and the number of such units is on the increase. To an extent, the abnormal conditions are the cause for this, but, perhaps, mismanagement of resources is far more responsible for the present state of industries.

Background: Bank credit is a scarce resource; hence it should be optimally utilised under all circumstances. For industrial units, it has become scarcer. There are many other contenders for bank credit: agriculture, small-scale industry, farmers, small man and many others. Public enterprises also approach commercial bank for their working capital requirements.

Notes

In view of the growing demand on bank funds from all sectors, industrial companies have no option but to use bank funds in the most efficient way. In the past, they misused or mismanaged the bank funds. Bank credit primarily meant for working capital finance was found to be used for long-term purposes and to finance subsidiaries and associated companies. Not only this, cheap credit available from banks has been used to build-up disproportionate stocks of materials to realise trading profits.

In fact, the misuse of bank funds was made possible by the existing system of bank lending, based on cash credit system.

The practice was to lend generally to the extent of 75 per cent of the value of inventory and receivables, the remaining 25 per cent being the margin. The value of inventory included purchases of materials on credit. Thus, this amounted to double financing – from creditors as well as banks. Bank lending, under the cash credit system, was directly related to security in the form of inventory and receivables, irrespective of borrower's operations. So long as the borrower continued to provide the required margin, the banker considered his advance to be safe and liquid, and did not bother about the way in which advance was being utilised. The borrower's limit was generally increased, without much questioning about his operations, whenever inventory and receivable levels went up. The banker never took a closer look into the affairs of the customer.

One important drawback of the system was that the banker sanctioned a maximum limit within which the borrower could draw at his will. Under this procedure, the level of advances in a bank is determined not by how much a banker can lend at a particular point of time but the borrower's decision to borrow at that time. Under a tight situation, such a system would put banks to considerable strain. The cash credit system makes credit planning by banks very difficult.

The existing practice in fixing limit was to value inventory at the market prices for fixing limit. For this reason and because of the availability of credit from creditors, a borrower was able to borrow more than his current assets requirements. Accordingly, it was possible for the borrower to divert banks' funds to acquire fixed assets, including investment stand make advances to subsidiaries and associated concerns.

In the early years, bank lending in India was mostly directed to financing of movement of agricultural produce from the grower to the trader, the task of financing foreign trade being handled mostly be foreign banks. Advances were sanctioned against the security of stocks pledged or hypothecated to the banks. Based on English banking practice, the purpose of commercial bank lending in India has traditionally been seen as the provision of short-term finance for business.

With the growth of industrialization, the same system of bank lending continued with minor changes, and the banker saw his function as meeting also the industry's need for short-term funds. Working capital finance was made available ostensibly for acquisition of current assets and as the advances were made available in cash credit accounts, repayable on demand, they were considered short-term in nature and self-liquidating in character. As industrialization in India was largely promoted by an earnest of good management, in addition to the security of the current assets of the borrowing company; security-cum-guarantee advances thus became the pattern of lending to industry. The security-oriented system tended to favor borrowers with strong financial resources, irrespective of their economic function.

With the advent of planning for economic development and a growing social awareness of the role of bank credit in the economy, it was felt that the prevailing commercial bank lending system had little social control and that it aided concentration of economic power. It was felt too that system was unresponsive to needs of the weaker sectors of the economy, small industry and agriculture and concentrated instead on security-cum-guaranteed-oriented lending to large

Notes

customers. The security-cum-guarantee system of lending was found inadequate also with the termination of the managing agency system. With the de-linking in of industrial units from the managing agency houses, the erstwhile guarantors sought termination of the guarantee obligations, the entry of new entrepreneurs into industry, with technical knowledge but lacking financial backing and managerial background, also called for a new approach to lending by banks.

It was against this background, the Reserve Bank of India appointed different study groups from time to time.

4.2.1 Recommendations of Dahejia Study Group

The National Credit Council constituted, in October 1968, a study Group under the Chairmanship of Shri V.T. Dahejia to examine the subjected of the extent to which credit needs of industry and trade are likely to be inflated and how such trends could be checked. Since the bulk of bank credit is short-term, the Group's enquiry was primarily concerned with the inflation of the short-term bank credit. The credit needs of industry or trade may be considered to be inflated or either of the two sectors may be regarded to have received credit in excess of its genuine requirements

1. If, over a period of years, the rise in short-term credit is found to be substantially higher than the growth in the value of industrial production;
2. If the rise in short-term credit in appreciably higher than the increase in inventories with industry or trade;
3. If there is a diversion of short-term bank borrowings of concerns in industry for building up of fixed assets or other non-current assets such as loans and investments;
4. If there is double or multiple financing of the same stock;
5. If the period of credit is unduly lengthened.

The Group submitted its report in September, 1969.

Major Findings

The major findings of Dahejia study Groups are listed below:

1. ***Expansion of Bank Credit to Industry in Excess of Output:*** The Group found that the bank credit during the period from 1960–61 to 1966–67 expanded at a higher rate than the rise in industrial output. This finding was supported by the available data on inventories in relation to short-term bank credit. Between 1961–62 and 1966–67, the rise in the value of inventories with industry was 80% while the rise in short-term bank credit was as much as 130%. The ratio of short-term bank borrowings to inventories went up from 40% in 1961–62 to 52% in 1966–67. A similar analysis showed that some industries, particularly those in the traditional group, and several industrial units obtained credit from banks over and above the rise in their production. The Group therefore came to the conclusion that in the absence of specific restraint, there was a tendency on the part of the industry generally to avail itself of short term credit from banks in excess of the amount based on the growth in production and/or inventories in value terms.
2. ***Fixing Credit Limits by Banks:*** The basis on which banks fix credit limits has an important bearing on the size of bank credit in relation to the requirements of individual borrowers. For fixing credit limit bans generally took into account several features of the working of the loaned concerns, such as production, sales, inventory levels, past utilization etc. The

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prevalent practices of banks in this regard were so varied that they were unlikely to prevent the emergence of excess demand for credit from certain borrowers. By and large, the scheduled banks were inclined generally to relate their credit limits to the security offered by their constituents but many do not appear to make any attempt to assess the overall financial position of the borrowers through a cash flow analysis and in the light of this study fixed their credit limits.

3. ***Valuation of Stock and Margin Requirements:*** Banks did not generally adopt a uniform method of valuation of stocks. The usual method, for indigenous goods was based on 'cost' or 'market value' whichever is lower and for imported goods on landed cost. Similarly, there was considerable divergence in practice as regards the prescription of margins by the banks. Some banks stipulated a lower margin or pledge advances against hypothecation of stocks, while a few others did not make this distinction. In the opinion of the Group, the varying practice could not be said to constitute an important factor in the emergence of excess credit.

4. ***Diversion of Short-term Credit to Acquisition of Long-term Assets:*** A study of 255 companies over the period from 1961–62 to 1966–67 showed a deterioration in their current ratio and the increase in short-term liabilities was utilized for financing the gap between long-term assets and long-term liabilities. One-fifth of the gross-fixed assets of these companies were financed by expansion in short-term liabilities including the bank loans.

   The tendency on the part of a number of industrial units to utilize short-term bank credit and other current liabilities for acquisition of non-current assets was, in the Group, due to (a) generally sluggish condition in the capital market since 1962 (b) the limited nature of the appraisal of application for short-term loans as compared to medium term loans and (c) stipulation of repayment schedules for medium loans.

5. ***Lending System:*** The Group considered that the lending system, as was prevalent in India banking, would have appeared greatly assisted prevalent in India banking, would have appear greatly assisted certain units in industry on increased reliance on short-term debt to finance their non-current investment. The working capital advances of banks were grated by way of cash credit limits which were only technically repayable on demand. The system was found convenient in view of the emphasis placed by banks on the security aspect. These short-term advances though secured by current assets were not necessarily utilized for short-term or self-liquidating in as much as although cash accruals arising from sales were adjusted in a cash credit account from time to time. The Group found that on a large number no credit balance emerged or debt balances fully wiped out over a period of years as the withdrawals were in excess of receipts. The possibility of heavy reliance on bank credit by industry arose mainly out of the way in which the system of cash credit-which accounted from about 70% of total bank credit, had been operated.

Suggestions

The Group was of the opinion that unless measures were taken to check the tendency for diversion of bank credit for acquiring long term assets, it might assume wider dimensions. The Group made following suggestions for a change in the lending system:

1. ***Method of Appraisal of Credit Applications:*** The appraisal of credit applications should be made with reference to the total financial situation, existing and projected, as shown by cash flow analysis and forecasts submitted by borrowers. This would help a diagnosis of the extent to which current liabilities of industrial units had bee put to non-current use and the manner in which liabilities and assets of borrowers were likely to move over a period of time. Initially, advances of, say ₹ 50 lakh and over should be analyzed this way and then the system may gradually be extended to borrowers with advances of over ₹ 10 lakh.

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2. ***Segregation of the Credit Market:*** The out standings in the existing as well as further cash credit accounts should be distinguished as between (i) 'the hard core' which would represent the minimum level of raw materials, finished goods and stores which the industry was required to hold for maintaining given level of production and (ii) the strictly short-term component which would be the fluctuating part of the account. The latter part of the account would represent the requirements of funds for temporary purchases, e.g. short-term increases in inventories, tax, dividend and bonus payments etc., the borrowing being adjusted in a short period out of sales. In the case of financially sound companies, the Group was of the opinion to segregate the hard ore element in the cash credit borrowings and put on a formal term loan basis and subject to repayment schedule. But when the borrowers' financial position was not too good or the size of the hard core was so large that repayment could not be expected within 7/10 years, it would be difficult for the banks to continue to carry these liabilities over along period of time. The possible solutions the promoters and their friends, additional issue of equity or preference capital, a debenture issue with a long maturity. When the hard core was to be placed on a formal should contain covenants in regard to the end-use of the loan, maintenance of minimum financial ratios, repayment obligations restrictions on investments on shares and debentures. To determine the hard core element of the cash credit account, the Group considered that it would be worthwhile to attempt to study of industry-wise norms for minimum inventory levels.

3. ***Double or Multiple Financing:*** Double or multiple financing may result where credit facilities are granted against receivables either by way of documents against acceptance bills or drawing against book debts; the purchases is also in position to obtain bank credit by way of hypothecation/pledge of the stock which have not been paid for. For eliminating double or multiple financing, the Group suggested that a customer should generally be required to confine his dealings to one bank only. In case the credit requirements of borrowers were to be large and could not be met out of resources of one bank, the Group has recommended the adoption of 'consortia' arrangement.

4. ***Period of Trade Credit:*** To prevent undue stretching of the period of trade credit and the typing up of resources of banks for unproductive purpose, the group suggested that the period of trade credit should not normally exceed 60 days and in special circumstance up to 90 days (excluding sales of capital equipment on deferred payment term). The undue delay in the settlement of bills by governments could be discouraged by stipulating that the latter should pay interest on bills if they were not paid within 90 days after their receipt.

5. ***Commitment Charges on Unutilised Limits:*** As a complementary measure to check the extension of extra credit, the group suggested that a levy of commitment charge on unutilized limited coupled with, if necessary, a minimum interest charge could be considered. The commitment levy might be progressively raised with the size of the unutilized limits. As the initial stages, limits sanctioned upon ₹ 10 lakh might be exempted from the point of view of administrative convenience.

6. ***Need for Greater Recourse to Bill Finance:*** The Study Group emphasized the need for greater recourse to bill finance. The Group recommended that commercial banks, industry and trade should try, where feasible and administratively convenient, to initiate and develop the practice of issuing usance bills as this would not only impose financial discipline, on the purchaser out also help supplier or producer to plan his financial commitments in a realistic manner. An adequate growth in the volume of usance bills would also facilitate the development of a genuine bill market in India. With a view to encouraging the development of such Group to the government. The Group believed that the loss in revenue following a reduction in stamp duty would be more than made good by the resultant larger volume of usance bills.

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7. ***Inventory Control:*** With regard to inventory control, the Group considered that as an integral part of restraining the demand for bank credit by industry, adequate attention should be paid to the question of adequacy or otherwise of stocks of inventories held by various industries and the scope for minimizing the stocks needed by industry.

8. ***Implications:*** Financial discipline implicit in Dehejia Study Group was intended to help the corporate and other borrowers in formulating financial plans, regulating production on a more rational basis and economizing the demand for bank credit as regards banks. A periodical release of the part of the resources otherwise locked up in 'roll over' cash credit/overdraft to industry would enable them to meet to these extent further demands of priority sectors of the economy and to diversify their loan transactions. This, in turn, would increase the scope for mobilization of deposits. Commercial banks would thus be able to play a more effective role in serving the community and the ends of social justice.

4.2.2 Recommendations of Tandon Committee

The Reserve Bank of India constituted Study Group to frame guidelines for follow up of bank credit in July 1974 under the Chairmanship of Shri Prakash Tandon. The terms of reference of the Group were:

1. To suggest guidelines for commercial bank to follow-up and supervise credit from the point of view of ensuring proper end-use of funds and keeping a watch on the safety of the advances and to suggest the type of operational data and other information that may be obtained by banks periodically from such borrowers and by the Reserve Bank of India from the leading banks.

2. To make recommendations for obtaining periodical forecasts from borrowers of (a) business/production plants, (b) credit needs.

3. To make suggestions for prescribing inventory norms for different industries both in the private and public sectors and indicate the broad criteria for deviating from these norms.

4. To suggest criteria regarding satisfactory capital structure and sound financial basis in relation to borrowings.

5. To make recommendations regarding the sources for financing the minimum working capital requirements.

6. To make recommendations as to whether the existing pattern of financing working capital requirements by cash credit/overdraft system etc. requires to be modified, if so, to suggest suitable modifications.

7. To make recommendations on any other related matter as the Group may consider germane to the subject of enquiry or any other allied matter which may be specifically referred to it by the Reserve Bank of India.

Observations and Recommendations

The Study Group submitted its report to the RBI in August 1975. The summary of the Group's main observations and recommendations is given below:

1. ***Supply of and Demand for Funds:*** Nationalization of the major commercial banks in 1969 raised expectations of a new sense of direction in bank lending, and indeed advances to new claimants of credit, and especially to small industry and agriculture had since gone up. The public sector has emerged is and important user of credit due both to its growing dominance and its turning increasingly to commercial banks for its working capital finance

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instead of relying on government. Another new source of demand was the growing awareness of the need to achieve and equitable geographical development of industry, and in its distribution of credit. Though industrial production increased at a slow pace but the call on bank credit essentially for maintaining inventories even at the same level had gone up with rising prices. If the growth process is resumed then the volume of inventory required to maintain a higher level of production will increase and correspondingly the demand for bank credit.

This state of affairs caused no problem in the year when the credit-deposit ratio in the banking system was low and a sudden spurt in credit demand could easily be taken care of and access to refinance from the Reserve Bank was easy. With control on monetary expansion as part of anti-inflationary policy and a rise in demand for funds – both from the old and the new claimants – the existing system of bank lending came under considerable strain and the fundamental weakness of the system had been exposed.

2. ***Coverage of the Proposed Approach:*** The proposed approach to lending and the style of credit may be extended to all borrowers having credit limits in excess of ₹ 10 lakh from the banking system, while the information system may be introduced, to start with, in respect of borrowers with limits of ₹ 1 crore and above from the entire banking system. Progressively, banks should extend this system, first to borrowers with limits of ₹ 50 lakh to ₹ 1 crore and next to those enjoying limits of ₹ 10 lakh to ₹ 50 lakh.

3. ***Information System:*** To meet the specific requirement of the new ventures and to ensure the end-use and safety of bank advance, the borrower is expected to subject himself to the budgeting and reporting system. The borrower will supply appropriate operational data and figures relating to financial position at periodical intervals on the prescribed forms which have been devised for the purpose. The information so furnished by the borrower will have to be screened thoroughly and speedily and a view taken of his total activities.

   All borrowers with total credit facilities from the Banking System in excess of ₹ 10 lakh should submit (i) Operating Statement (ii) Funds Flow Statements (iii) Peak Level Balance Sheet and Pro forma Balance Sheet for the ensuing year at the time of submitting the loan application (whether for renewal/enhancement of fresh limits). The borrower with aggregate credit facilities from the Banking System exceeding ₹ One crore should submit (i) quarterly operating statement (ii) quarterly funds flow statement and (iii) current assets and current liabilities every quarter for the purpose of follow-up.

4. ***Follow-up:*** A bank has to follow-up and supervise the use of credit to verify first whether the assumptions on which the lending decision was taken continue to hold good, both in regard to the borrower's operations and the environment, and second, whether the end-use in according to the purpose for which the credit was given. From the quarterly expectations and signs, if any, of significant divergence reading as red signals to both the banker and the customer. However, variance of say +10% may be treated as normal. In addition to the quarterly data, the larger borrowers should submit a half yearly pro forma balance sheet and profit and loss account within two months from the end of the half year.

5. ***Interfirm Comparison:*** To facilitate interfirm and industry-wise comparison for assessing efficiency, it would be of added advantage if companies in the same industry could be grouped under three or four categories, say, according to size of sales and the group-wise financial ratios compiled by the Reserve Bank of India, for furnishing to the banks. Besides examining financial and operating ratios, certain productivity ratios may also be examined to determine efficiency in use of resources – man, money, machines and materials. A banker can choose his own criteria, but some useful ones are: labor efficiency; capital efficiency and fixed assets efficiency.

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6. ***Classification of Customers:*** For purposes of better control, there should a system of borrower classification in each bank, within a credit-rating scale. Such a system of classification according to credit-risk will facilitate easy identification of the borrower whose affairs require to be watched with more than ordinary care. An incidental advantage of such classification will be the formulation of a rational base for purpose of fixing the rates of interest for the respective borrowers.

7. ***Norms for Capital Structure:*** The debt-equity relationship is a relative concept that depends on several factors and circumstances such as the state of the capital market at any one time, government policy on created money, the need to maintain current assets at a specified level (which again is contingent on other factors), marginal efficiency of capital or the opportunity cost, etc. The experience of other countries in this matter may not be of much assistance in formulating guidelines in the India context. In discussing norms for capital structure, the Group kept in mind both the relationships-long-term debt to equity and total outside liabilities to equity. Where a company's long-term debt-net worth and total outside liabilities-net worth ratios are worse than the medians, the banker would endeavor to persuade the borrower to strengthen his equity base as early as possible. This would be a more practical approach for the banker than attempting to legislate absolute standards of long-term debt – net worth and total outside liabilities – net worth ratios for all industries or even industry by industry.

   The impact of taxation in considering this subject is also important for, under the tax structure, it is advantageous to trade as much as possible on borrowed capital to maximize earnings per share. The higher the level of borrowings, or the financial leverage, the greater is the advantage in view of this and coupled with the cheap money policy, there may be limited incentive to the borrower for efficient management of funds. Introduction of higher interest rates in the banking system has changed this position. In fact, the lending banker likes to see as high an equity stake as possible funds so further. However, on cannot lose sight of the need to promote the capital market while resolving this dichotomy of interest between the banker and borrower as the ultimate goal being to assist in maximizing investment and production. If the end-product of industry has to be sold at a cheaper price and adequate dividends are also to be given to make equity attractive to the investor, no company can afford, even if it were possible, to trade entirely on owned funds, nor rely too heavily on borrowed funds. There has thus to be a balance between the two – what the company provides and what it borrows.

Problems in Implementing Tandon Committee Report

The Reserve Bank of India in its notification dated August 21, 1975 considered some of the main recommendations of the Group and advised the banks accordingly. The scheme was required to be implemented at the micro-level where advances were made to the borrowers. But a thorough understanding of the scheme required knowledge about the analysis of financial statements and credit appraisal by the officers at branch level. This knowledge was slowly spreading and till the officers at the grass root level were equipped with the basic knowledge of credit appraisal, the implementation was bound to be quite slow.

Another problem was that of gearing the attitudes of the bank men to this new scheme being something new as being not in the routine nature of credit appraisal, it was difficult task to kindle the interest of the staff to study the Tandon Scheme for enforcing it in the case of big industrial customers. In addition, the new scheme also called for in-depth knowledge about each industry and various units in each industry so that the norms could be realistically applied in each case to determine the level of current assets, working capital gap and the style of credit.

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It's not only the bankers but also the customers were required to be trained in understanding the implications of the norms and the quarterly information system, an innovation brought in by the Tandon committee. No doubt the big parties had the qualified staff to give the data in forms prescribed on quarterly basis, but these forms were not forthcoming in time. If they were submitted each time after the current quarter or even much later upon reminder, the very purpose of calling for quarterly data were to be defeated as in that event follow-up supervision and control were difficult or not possible.

In the case of some of the big parties, it had been found that they were run like family concerns on partnership or proprietary basis and they did not maintain proper books of accounts. Such parties were likely to plead inability to furnish the data as per the Tandon form. To make matter worse or difficult for banks, they maintained account in regional language too. Even if the forms were coming with lot of persuasion and understanding form the borrowers it was difficult to convince them in individual cases to abide by the norms for carrying current assets if they were already above the norms. No doubt, ultimately it was the banker's judgment that should prevail in credit decisions after a dialogue with the parties, but in superimposing such decisions over the customers' judgment, there was likely to be misunderstanding or clash sort of thing with the borrowers. It was quite possible that aggrieved borrowers getting lesser limit might perhaps consider higher limits.

Another problem which was no less important could be about the manipulation in the figures of "other current assets", "other current liabilities", etc. as the permissible bank finance was based on figure work only. Further it was felt that the calculation of excess finance poses a realistic problem because while the working capital gap was computed on the basis of the projected net current assets, the figures of liability were the existing ones and not the projected levels. For growing higher levels of current assets, the Committee provided exceptions where under higher holdings might be permitted. It was feared that each party might argue to be brought within the exceptions to circumvent the rigors of the norms.

However, in order to improve the operational efficiency and to develop and better understanding of the new lending system of banks, if all the banks are serious in implementing the Tandon Scheme and if they are able to get the cooperation from their customers, the problem areas are nothing and can be ignored. On the other hand, if unwarranted concessions and deviations are shown by banks against the ethics of the implementation of the scheme as a whole, the very philosophy of the Tandon Scheme will be defeated and it will create a situation in which the scrupulous banks will regret for going the Tandon way.

4.2.3 Recommendations of Chore Committee

While reviewing the monetary and credit trends in March 1979, the Governor of the Reserve Bank of India stressed the need for exercising continued restraint on expansion of credit. He also indicated in his meeting with bankers the need for considering certain long-term issues relating to baking operations. In his letter dated 16th March, 1979 to all scheduled commercial banks, he indicated:

"I would like to initiate action on certain structural matters which need further examination. It is necessary to take a fresh look at another major problem faced by banks in implementing the credit regulatory measures, *viz*., the extensive use of the cash credit system. Its drawbacks have been pointed out by the various Committees in the past including the Tandon Committee, which suggested the bifurcation of credit limits into a demand loan and a fluctuating cash credit component. Although the banks were advised to implement this recommendation, I am afraid; the progress achieved has been very slow. Clearly, this problem needs to be looked into further and for this purpose I purposes to set up immediately a small Working Group, to report to me….. on the reforms to be introduced".

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It was in this context that the Reserve Bank of India appointed the Working Group under the Chairmanship of Shri K.B. Chore to review the system of credit in all aspects. The term of reference of the Working Group was as follows:

1. To review the operation of the cash credit system with reference to the gap between sanctioned credit limits and the extent of their utilization;
2. In the light of the review, to suggest:
   (a) Modification in the system with a view to making the system more amenable to rational management of funds by commercial banks, and/or
   (b) Alternative types of credit facilities, which would ensure greater credit discipline and also enable banks to relate credit limits to increase in output or other productive activities; and
3. To make recommendations and any other related matter as the Group may germane to the subject.

Recommendations

The Group made following recommendations in its final report.

1. ***Credit System:*** The advantages of the existing system of extending credit by a combination of the three types of lending, viz., cash credit, loan and bill should be retained. At the same time, it is necessary to give some directional changes to ensure that wherever possible the use of cash credit would be supplanted by loans and bills. It would also be necessary to introduce necessary corrective measures to remove the impediments in the use of bill system of finance and also to remove the drawbacks observed in the cash credit system.
2. ***Bifurcation of Credit Limits:*** Bifurcation of cash credit limit into a demand loan portion and a fluctuating cash credit component has not found acceptance either on the part of the banks or the borrowers. Such bifurcation may not serve the purpose of better credit planning by narrowing the gap between sanctioned limits and the extent of utilization thereof. It is not likely to be voluntarily accepted and it does not confer enough advantages to make it compulsory.
3. ***Reducing Over-dependence on Bank Borrowings:*** The need for reducing the over-dependence of the medium and large borrowers-both in the private and public sectors-on bank finance for their production/trading purposes is recognized. The net surplus cash generation of an established industrial unit should be utilized partly as least for reducing borrowing for working capital purposes.
4. ***Peak level and Normal Non-peak Level Limits to be Separate:*** While assessing the credit requirements, the bank should appraise and fix separate limits for the 'normal non-peak level' as well as for the 'peak level' credit requirements indicating the periods during which the separate limits would be utilized by the borrower. This procedure would be extended to all borrowers having working capital limits of ₹ 10 lakh and above. One of the important criteria for deciding such limits should be the borrowers' utilization of credit limits in the past.
5. ***Financing Temporary Requirements through Loan:*** If any ad-hoc or temporary accommodation is required in excess of the sanctioned limit to meet unforeseen contingencies the additional finance should be given, where necessary, through a separate demand loan account or a separate 'non-operable cash credit account'. There should a stiff penalty for such demand loan or non-operable cash credit portion, at least two per cent above the normal rate, unless Reserve Bank exempts such penalty. This discipline may be made applicable in cases involving working capital limits or ₹ 10 lakh and above.

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6. ***Penal Interest:*** The borrower should be asked to give his quarterly requirement of funds before the commencement of the quarter on the basis of his budget, the actual requirement being within the sanctioned limit for the particular peak level/non-peak level periods. Drawing less than or in excess of the operative limits so fixed (with a tolerance of 10% either way) but not exceeding sanctioned limit would be subject to a penalty to be fixed by the Reserve Bank from time to time. For the time being the penalty may be fixed at 2% per annum. The borrower would be required to submit his budgeted requirements in triplicate and a copy each would be sent immediately by the branch to the controlling office for record. The penalty will be applicable only in respect of parties enjoying credit limits of ₹ 10 lakh and above, subject to certain exemptions.

7. ***Information System:*** The non-submission of the returns in time is partly due to certain features in the forms themselves. To get over this difficulty, simplified forms have been proposed. As the quarterly information systems, is part and parcel of the revised style of lending thunder the cash credit system, if the borrower does not submit the return within the prescribed time, he should be penalized by charging the whole outstanding in the account at a penal rate of interest, 10% per annum more than the contracted rate for the advance from the due date of the return till the date of its actual submission.

8. ***Relaxation from Norms:*** Requests for relaxation of inventory norms and for ad-hoc increase in limits would be subjected by banks to close scrutiny and agreed to only in exceptional circumstances.

9. ***Toning Up-Assessment Technique:*** The banks should devise their own check lists in the light of the instructions issued by the Reserve Bank for the scrutiny of data the operational level.

10. ***Delays in Sanction:*** Delays on the part of banks in sanctioning credit limits could be reduced in cases where the borrowers cooperate in giving the necessary information about their past performance and future projections in time.

11. ***Bill System:*** As on of the reasons for the slow growth of the bill system is the stamp duty on usance bills and difficulty in obtaining the required denominations of stamps, these questions may have to be taken up with the state governments.

12. ***Sales Bill:*** Bank should review the system of financing book debts though cash credit and insist on the conversion of such cash credit limits into bill limits.

13. ***Drawee Bill System:*** A stage has come to enforce the use of drawee bills in the lending system by making it compulsory for banks to extend at least 50% of the cash credit limit against raw materials to manufacturing units whether in the public or private sector by way of drawee bills. To start with, this discipline should be confined to borrowers having aggregate working capital limits of ₹ 50 lakh and above from the banking system.

14. ***Segregation of Dues of Small Scale Industries:*** Bank should insist on the public sector undertakings/large borrowers to maintain control accounts in their books to give precise data regarding their dues to the small units and furnish such data in their quarterly information system. This would enable the banks to take suitable measures for ensuring payment of the dues to small units by a definite period by stipulating, if necessary, that a portion of limits for bills acceptance (drawee bills) should be utilized only for drawee bills of small scale units.

15. ***Discount House:*** To encourage the bill system of financing and to facilitate call money operations an autonomous financial institution on the lines of the Discount House in UK may be set up.

16. ***Correlation between Production and Bank Finance:*** No conclusive data are available to establish the degree of correlation between production and quantum of credit at the

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industry level. As this issue is obviously of great concern to the monetary authorities the Reserve bank may undertake a detailed scientific study in this regard.

17. ***Communication of Credit Control Measures to Branches and Follow-up:*** Credit control measures to be affective will have to be immediately communicated to the operational level and followed up. There should be a 'Cell' attached to the Chairman's office at the Central Office of each bank to attend to such matters. The Central Offices of banks should take a second look at the credit budget as soon as changes in credit policy are announced by the Reserve Bank and revise their plan of action in the light of the new policy and communicate the corrective measures to the operational levels as quickly as possible.

18. ***Monitoring of Key Branches and Critical Accounts:*** The banks should continuously monitor the credit portfolio of the 'key' branches irrespective of the fact whether there is a change in credit policy or not. For effective credit monitoring, the number of critical accounts should be kept under a close watch over the utilization of limits and inventory build up.

19. ***Delay in Collection of Bills/Cheques:*** To reduce the delay in collection of bills and cheques, return of documents by the collecting branches, etc., the Group suggested toning up the communication channels and systems and procedures within the banking system.

20. ***Bill Facilities and Current Accounts with other Banks:*** Although banks usually object to their borrower's dealing with other banks without their consent, some of the borrowers still maintain current accounts and arrange bill facilities with other banks. Apart from diluting the control over the advance by the main banker, this practice often enables the borrower to divert sales proceeds for unapproved purposes without the knowledge of his main banker. Banks should be suitably advised in this matter by the Reserve Bank to check this unhealthy practice.

4.2.4 Recommendations of Marathe Committee

The Reserve Bank of India, in 1982, appointed a committee under the chairmanship of Marathe to review the working of Credit Authorisation Scheme (CAS) and suggest measures for giving meaningful directions to the credit management function of the Reserve Bank. The recommendations of the committee have been accepted by the Reserve Bank of India with minor modifications.

The principal recommendations of the Marathe Committee include:

1. The committee has declared the Third Method of Lending as suggested by the Tandon Committee to be dropped. Hence, in future, the banks would provide credit for working capital according to the Second Method of Lending.

2. The committee has suggested the introduction of the 'Fast Track Scheme' to improve the quality of credit appraisal in banks. It recommended that commercial banks can release without prior approval of the Reserve Bank 50% of the additional credit required by the borrowers (75% in case of export oriented manufacturing units) where the following requirements are fulfilled:

   (a) The estimates/projections in regard to production, sales, chargeable current assets, other current assets, current liabilities other than bank borrowings, and net working capital are reasonable in terms of the past trends and assumptions regarding most likely trends during the future projected period.

   (b) The classification of assets and liabilities as 'current' and 'non-current' is in conformity with the guidelines issued by the Reserve Bank of India.

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(i) The projected current ratio is not below 1.33: 1.

(ii) The borrower has been submitting quarterly information and operating statements (Form I, II and III) for the past six months within the prescribed time and undertakes to do the same in future also.

Public Deposits: Business firms borrow directly from public in the nature of unsecured deposits. Banks accept public deposits or term deposits. It is very popular for medium term finance, when there is no availability of finance from banks. Public deposits as a source of finance have a benefit like simple and convenient tax benefit, trading on equity, no security etc. NBFCs cannot borrow by issue of public deposits more than 25 per cent of its paid up capital and free reserve.

Loan from Financial Institutions: Financial institutions such as Commercial Banks, Life Insurance Corporation of India (LIC), General Insurance Corporation (GIC), Unit Trust of India (UTI), State Financial Corporations (SFCs), Industrial Development Bank of India (IDBI), etc., provide short-term medium term and long-term loans. It is most suitable for financing medium-term demand of working capital. There will be a fixed rate of interest charge that is changed to profit and loss account and can get tax benefit.

4.2.5 Recommendations of Kannan Committee

A committee constituted by the Indian Banks' Association to examine the relevance of the concept of Maximum Permissible Bank Finance (MPBF) as a method of assessing the requirements of bank credit for working capital, and to suggest alternative methods. The committee was headed by K. Kannan, Chairman, Bank of Baroda and its report submitted in 1997, includes the following recommendations:

1. The MPBF prescription is not to be enforced and banks may use their discretion to determine the credit limits of corporates.
2. The Credit Monitoring Arrangement and QIS may cease to be regulatory requirements.
3. The financing bank may use its discretion to determine the level of stocks and receivables as security for working capital assistance.
4. The mechanism for verifying the end-use of bank credit should be strengthened.
5. A credit Information Bureau may be floated independently by banks.

Since April 1997, banks have been given the freedom to assess working capital requirement within prudential guidelines and exposure norms. Banks may evolve their methods to assess the working capital needs of borrowers – the Turnover Method or the Cash Budget Method or the MPBF System with necessary modifications or any other system.

Self Assessment

Fill in the blanks:

4. A budget is a financial and/or quantitative expression of business plans and policies to be pursued in the ..... period of time.
5. The technique of ratio analysis can be employed for measuring ..... liquidity or working capital position of a firm.
6. ..... is the transfer of a legal or equitable interest in a specific immovable property for the payment of a debt.

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7. MPBF is the acronym for .....
8. ..... committee was set to review the working of Credit Authorisation Scheme (CAS) and suggest measures for giving meaningful directions to the credit management function of the Reserve Bank.
9. The RBI does not insist on a rigid formula of ..... for lending by commercial banks to industries for working capital purposes.
10. A ..... is an undertaking by a bank to honour the obligations of its customer up to a specified amount.

4.3 MPBF Norms

MPBF is the acronym for Maximum Permissible Bank Finance. As already discussed above, the Tandon Committee Report, basically identified the function of bank finance as supplementing the borrower's resources to carry on acceptable level of current assets.

The implications of this were twofold;

1. The level of current assets must be reasonable and based on certain norms.
2. A part of the funds required for carrying current assets must be found from long-term funds, comprising owned funds and term borrowings including other non-current liabilities.

The major recommendations made by the Group, covered the undernoted aspects of bank lending:

1. Norms for inventory & receivables
2. Approach to lending
3. Follow-up, supervision and control

In the context of its approach to the role of Bank Finance, the Committee suggested three alternatives (more popularly known as methods of lending) for working out the maximum permissible level of bank borrowings:

First Method of Lending

Banks can work out the working capital gap, i.e. total current assets less current liabilities other than bank borrowings (called Maximum Permissible Bank Finance or MPBF) and finance a maximum of 75 per cent of the gap; the balance to come out of long-term funds, i.e., owned funds and term borrowings. This approach was considered suitable only for very small borrowers i.e. where the requirements of credit were less than ₹ 10 lacs.

Second Method of Lending

Under this method, it was thought that the borrower should provide for a minimum of 25% of total current assets out of long-term funds i.e., owned funds plus term borrowings. A certain level of credit for purchases and other current liabilities will be available to fund the build up of current assets and the bank will provide the balance (MPBF). Consequently, total current liabilities inclusive of bank borrowings could not exceed 75% of current assets. RBI stipulated that the working capital needs of all borrowers enjoying fund based credit facilities of more than ₹ 10 lacs should be appraised (calculated) under this method.

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Third Method of Lending

Under this method, the borrower's contribution from long-term funds will be to the extent of the entire core current assets, which has been defined by the Study Group as representing the absolute minimum level of raw materials, process stock, finished goods and stores which are in the pipeline to ensure continuity of production and a minimum of 25% of the balance current assets should be financed out of the long term funds plus term borrowings.

Caution This method was not accepted for implementation and hence is of only academic interest.

Notes The RBI does not insist on a rigid formula of maximum permissible bank finance for lending by commercial banks to industries for working capital purposes.

This was given up sometime in 1997. Banks, however, are free to follow the earlier norms of MPBF based on norms for stock, debtors, and so on.

Example: Metalman co. Ltd. is a pipe manufacturing company. Its production cycle indicates that materials are introduced in the beginning of the production cycle; wages and overhead accrue evenly throughout the period of the cycle. Wages are paid in the next month following the month of accrual. Work-in-process includes full units of raw materials used in the beginning of the production process and 50% of wages and overheads are supposed to be conversion costs. Details of production process and the components of working capital are as follows:

Production of pipes	12, 00,000 units
Duration of the production cycle	one month
Raw materials inventory held	one month consumption
Finished goods inventory held for	Two months
Credit allowed by creditors	one month
Credit given to debtors	Two months
Cost price of raw materials	₹ 60 per unit
Direct wages	₹ 10 per unit
Overheads	₹ 20 per unit
Selling price of finished pipes	₹ 100 per unit

Required to calculate:

(a) The amount of working capital required for the company.

(b) The maximum permissible bank finance under all the three methods of lending norms as suggested by the Tandon Committee, assuming the value of core current assets: ₹ 1,00,00,000

Solution

Notes

(a) A – Current Assets: Amt. in ₹

(i) Raw material inventory - (1 month) - 12,00,000 units × $60 \times \frac{1}{12}$ 60,00,000

(ii) Work-in-progress - production cycle 1 month

Raw material (added in the beginning)	₹ 60,00,000
Wages (12,00,000 10 1/2) × 50% =	₹ 5,00,000
Overheads 20 × 10,00,000 $\times \frac{1}{12} \times 50\%$ =	₹ 10,00,000
Total	75,00,000

(iii) Finished goods (inventory held for 2 months)

Total cost Material	60.00
Labour	10.00
Overheads	20.00 = $90 \times 12,00,000 \times \frac{2}{12}$

(iv) Debtors for 2 months $12,00,000 \times ₹90 \times \frac{2}{12}$ 1,80,00,000

Total current assets 4,95,00,000

B – Current liabilities:

(v) Creditors for Raw Material -01 month

7,20,00,000 $\times \frac{1}{12}$ 60,00,000

(vi) Creditors for wages

12,00,000 × 10 $\times \frac{1}{12}$ 10,00,000

Total current liabilities	70,00,000
Net working capital	4,25,00,000

(b) Computation of Maximum permissible Bank Finance according to Tandon Committee norms

1st Method	₹
CAs	4,95,00,000
CLs	70,00,000
Working capital gap	4,25,00,000
Less: 25% from long-term sources	(1,06,25,000)
Max permissible Bank Finance	3,18,75,000

Notes

2nd Method

	₹
Working capital gap	4,25,00,000
Less: 25% of CAs	(1,23,75,000)
MPBF	3,01,25,000

3rd Method

Total current assets – Core current assets = ₹ 4,95,00,000 – 1,00,00,000

= ₹ 3,95,00,000

	₹
Real current assets	3,95,00,000
Less: 25%	98,75,000
	2,96,25,000
Less: Current Liabilities	70,00,000
MPBF	**2,26,25,000**

Case Study

Bajaj Electronics Company

This case has been framed in order to test the skills in evaluating a credit request and reaching a correct decision. Perluence International is large manufacturer of petroleum and rubber-based products used in a variety of commercial applications in the fields of transportation, electronics, and heavy manufacturing. In the northwestern United States, many of the Perluence products are marketed by a wholly-owned subsidiary, Bajaj Electronics Company. Operating from a headquarters and warehouse facility in San Antonio, Strand Electronics has 950 employees and handles a volume of $85 million in sales annually. About $6 million of the sales represents items manufactured by Perluence.

Gupta is the credit manager at Bajaj electronics. He supervises five employees who handle credit application and collections on 4,600 accounts. The accounts range in size form $120 to $85,000. The firm sells on varied terms, with 2/10, net 30 mostly. Sales fluctuate seasonally and the average collection period tends to run 40 days. Bad-debt losses are less than 0.6 per cent of sales.

Gupta is evaluating a credit application from Booth Plastics, Inc., a wholesale supply dealer serving the oil industry. The company was founded in 1977 by Neck A. Booth and has grown steadily since that time. Bajaj Electronics is not selling any products to Booth Plastics and had no previous contact with Neck Booth.

Bajaj Electronics purchased goods from Perluence International under the same terms and conditions as Perluence used when it sold to independent customers. Although Bajaj Electronics generally followed Perluence in setting its prices, the subsidiary operated independently and could adjust price levels to meet its own marketing strategies. The Perluence's cot-accounting department estimated a 24 per cent markup as the average for items sold to Pucca Electronics. Bajaj Electronics, in turn, resold the items to yield a 17 per cent markup. It appeared that these percentages would hold on any sales to Booth Plastics.

Bajaj Electronics incurred out-of pocket expenses that were not considered in calculating the 17 per cent markup on its items. For example, the contact with Booth Plastics had been

Contd...

Notes

made by James, the salesman who handled the Glaveston area. James would receive a 3 per cent commission on all sales made Booth Plastics, a commission that would be paid whether or not the receivable was collected. James would, of course, be willing to assist in collecting any accounts that he had sold. In addition to the sales commission, the company would incur variable costs as a result of handling the merchandise for the new account. As a general guideline, warehousing and other administrative variable costs would run 3 per cent sales.

Gupta Holmstead approached all credit decisions in basically the same manner. First of all, he considered the potential profit from the account. James had estimated first-year sales to Booth Plastics of $65,000. Assuming that Neck Booth took the, 3 per cent discount. Bajaj Electronics would realize a 17 per cent markup on these sales since the average markup was calculated on the basis of the customer taking the discount. If Neck Booth did not take the discount, the markup would be slightly higher, as would the cost of financing the receivable for the additional period of time. In addition to the potential profit from the account, Gupta was concerned about his company's exposure. He knew that weak customers could become bad debts at any time and therefore, required a vigorous collection effort whenever their accounts were overdue. His department probably spent three times as much money and effort managing a marginal account as compared to a strong account. He also figured that overdue and uncollected funds had to be financed by Bajaj Electronics at a rate of 18 per cent. All in all, slow-paying or marginal accounts were very costly to Bajaj Electronics.

With these considerations in mind, Gupta began to review the credit application for Booth Plastics.

Question

How would you judge the potential profit of Bajaj Electronics on the first year of sales to Booth Plastics and give your suggestion regarding Credit limit. Should it be approved or not, what should be the amount of credit limit that electronics give to Booth Plastics?

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books

Self Assessment

Fill in the blanks:

11. MPBF norms were proposed by the ..... Committee.
12. ..... Committee was constituted by the Indian Banks' Association to examine the relevance of the concept of MPBF as a method of assessing the requirements of bank credit for working capital.
13. Business firms borrow directly from public in the nature of ..... deposits.
14. The establishment of discount houses was suggested under the recommendations of ..... committee.
15. There are ..... basic approaches for determining an appropriate working capital financing mix.
16. ..... refers to a process of matching maturities of debt with the maturities of financial needs.
17. ..... Group was of the opinion that unless measures were taken to check the tendency for diversion of bank credit for acquiring long term assets, it might assume wider dimensions.

Notes

4.4 Summary

- Working capital is a means to run the business smoothly and profitably, and not an end.
- Thus, concept of working capital is a means to run importance in a going concern.
- A going concern, usually, has a positive balance of working capital as its own excess of current assets over current liabilities, but sometimes the uses of working capital may be more than the sources resulting into a negative value of working capital.
- This negative balance is generally offset soon by gains in the following periods.
- A study of changes in the uses and sources of working capital is necessary to evaluate the efficiency with which the working capital is employed in a business.
- This involves the need of working capital analysis.
- The norms of working capital finance followed by bank since mid-70's were mainly based on the recommendations of the Tandon Committee.
- The Chore Committee made further recommendations to strengthen the procedures and norms for working capital finance by banks.
- In the deregulated economic environment in India recently, banks have considerably relaxed their criteria of lending.
- In fact, each bank can develop its own criteria for the working capital finance.

4.5 Keywords

Aggressive Approach: The aggressive approach suggests that the entire estimated requirements of currents asset should be financed from short-term sources and even apart of fixed assets investments be financed from short-term sources.

Conservative Approach: This approach suggests that the entire estimated investments in current assets should be financed from long-term sources and the short-term sources should be used only for emergency requirements**.**

Funds flow analysis: A technical device designated to study the sources from which additional funds were derived and the use to which these sources were put.

Hedging: The term 'hedging' usually refers to two off-selling transactions of a simultaneous but opposite nature which counterbalance the effect of each other.

Letter of credit: A letter of credit popularly known as L/C is an undertaking by a bank to honour the obligations of its customer up to a specified amount.

4.6 Review Questions

1. Examine the various procedures and norms for working capital finance by banks in India. What are the issues related to bank finance in India?
2. Discuss, in detail, the short-term financing of working capital for a business organization.
3. M/s System & Technology has furnished the following details relating to Working Capital Requirements from a Bank:

Current Assets Holding - Projected	In Lacs
Inventory	45

Notes

Debtors	15
Receivables	10
Cash	10
Others	8
Total	88

(a) Assess the MPBF using the second method of Tandon Committee (Current Liabilities other than bank borrowings are ₹ 30 lacs).

(b) What will be the MPBF if the borrower brings ₹ 28 lacs as his Margin?

4. XYZ Co. Ltd. is a pipe manufacturing company. Its production cycle indicates that materials are introduced in the beginning of the production cycle; wages and overhead accrue evenly throughout the period of the cycle. Wages are paid in the next month following the month of accrual. Work-in-process includes full units of raw materials used in the beginning of the production process and 50% of wages and overheads are supposed to be conversion costs. Details of production process and the components of working capital are as follows:

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Credit given to debtors	Two months
Cost price of raw materials	₹ 60 per unit
Direct wages	₹ 10 per unit
Overheads	₹ 20 per unit
Selling price of finished pipes	₹ 100 per unit

Calculate:

(a) The amount of working capital required for the company.

(b) The maximum permissible bank finance under all the three methods of lending norms as suggested by the Tandon Committee, assuming the value of core current assets: ₹ 1, 00,00,000

5. What do you think as the reason behind the security-oriented system earlier existing in India to have tended to favor borrowers with strong financial resources?

6. What problem is posed by the calculation of excess finance?

7. Critically evaluate the recommendations of Kannan Committee on cash management.

8. Do you think that discount houses as suggested by Chore Committee have any significance in Indian parlance? Justify your answer with well grounded reasons.

9. Examine the significance of the recommendations made by Tandon Committee on cash management.

10. Why do you agree/disagree by the third method of lending as suggested by the Tandon Committee to be dropped?

Notes

Answers: Self Assessment

1.	Conservative	2.	Hedging
3.	low profits, low risk	4.	Future
5.	Short-term	6.	Mortgage
7.	Maximum Permissible Bank Finance	8.	Marathe
9.	maximum permissible bank finance	10.	letter of credit
11.	Tandon	12.	Kannan
13.	unsecured	14.	Chore
15.	three	16.	Hedging
17.	Dahejia		

4.7 Further Readings

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Online links

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Notes

Unit 5: Credit Risk Management

CONTENTS

Objectives

After studying this unit, you will be able to:

- Discuss the meaning and functions of risk management
- Identify the categories of risk
- Explore the definition of credit risk
- Explain the managing of credit risk
- Describe the approaches to credit risk measurement

Introduction

Credit risk is the risk that a borrower will not repay a loan according to the terms of the loan, either defaulting entirely or making late payments of interest or principal. Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the

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risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks.

In recent years, credit risk measurement and management has taken centre stage in almost all discussions involving financial institutions. Financial institutions have to look at how much credit risk they face and how to manage risk. The key questions asked in credit risk are:

- What are the chances that a borrower will default on its loan obligations?
- What is the value of a risky loan?

Credit risk is the oldest risk among the various types of risks in the financial system, especially in banks and financial institutions due to the process of intermediation. Managing credit risk has formed the core of the expertise of these institutions. While the risk is well known, growth in the markets, disintermediation, and the introduction of a number of innovative products and practices have changed the way credit risk is measured and managed in today's environment.

5.1 Risk Management

For the purpose of these guidelines financial risk in banking organization is possibility that the outcome of an action or event could bring up adverse impacts. Such outcomes could either result in a direct loss of earnings/capital or may result in imposition of constraints on bank's ability to meet its business objectives. Such constraints pose a risk as these could hinder a bank's ability to conduct its ongoing business or to take benefit of opportunities to enhance its business.

Regardless of the sophistication of the measures, banks often distinguish between expected and unexpected losses.

Did u know? **What are expected and unexpected losses?**

Expected losses are those that the bank knows with reasonable certainty will occur (e.g., the expected default rate of corporate loan portfolio or credit card portfolio) and are typically reserved for in some manner. Unexpected losses are those associated with unforeseen events (e.g. losses experienced by banks in the aftermath of nuclear tests, Losses due to a sudden down turn in economy or falling interest rates). Banks rely on their capital as a buffer to absorb such losses.

Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty. While the types and degree of risks an organization may be exposed to depend upon a number of factors such as its size, complexity business activities, volume etc, it is believed that generally the banks face Credit, Market, Liquidity, Operational, Compliance/legal/ regulatory and reputation risks.

Risk Management is a discipline at the core of every financial institution and encompasses all the activities that affect its risk profile. The acceptance and management of financial risk is inherent to the business of banking and banks' roles as financial intermediaries. Risk management as commonly perceived does not mean minimizing risk; rather the goal of risk management is to optimize risk-reward trade-off. Notwithstanding the fact that banks are in the business of taking risk, it should be recognized that an institution need not engage in business in a manner that unnecessarily imposes risk upon it: nor it should absorb risk that can be transferred to other participants. Rather it should accept those risks that are uniquely part of the array of bank's services.

A risk management framework encompasses the scope of risks to be managed, the process/ systems and procedures to manage risk and the roles and responsibilities of individuals involved in risk management.

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Caution The framework should be comprehensive enough to capture all risks a bank is exposed to and have flexibility to accommodate any change in business activities.

Risk management systems have to fulfill three main functions:

- The collection and processing of indicators in accordance with the information needs of the recipients;
- The analysis of changes in the portfolio value depending on changes in defaults in the credit business and the consolidation of these results into values that are relevant for risk controlling; and
- Monitoring the risks to be able to detect ahead of time if limits are about to be exceeded.

As the implementation of modern IT-based risk management systems is very costly, special attention has to be paid to their integration in existing processes as well as to their acceptance on the part of the employees.

5.1.1 Functions of Risk Management

Risk management contains:

1. Identification,
2. Measurement,
3. Aggregation,
4. Planning and management,
5. As well as monitoring of the risks arising in a bank's overall business.

Notes Risk management is thus a continuous process to increase transparency and to manage risks.

5.1.2 Categories of Risk

Banking risks can be broadly categorized as under:

1. Credit Risk
2. Interest Rate Risk
3. Market Risk
4. Liquidity Risk
5. Operational Risk

1. ***Credit Risk:*** Credit risk is the oldest risk among the various types of risks in the financial system, especially in banks and financial institutions due to the process of intermediation. Managing credit risk has formed the core of the expertise of these institutions. While the risk is well known, growth in the markets, disintermediation, and the introduction of a number of innovative products and practices has changed the way credit risk is measured and managed in today's environment. Credit risk enters the books of a bank the moment

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the funds are lent, deployed, invested or committed in any form to counterparty whether the transaction is on or off the balance sheet.

2. ***Interest Rate Risk:*** Interest Rate Risk (IRR) arises as a result of change in interest rates on rate earning assets and rate paying liabilities of a bank. The scope of IRR management is to cover the measurement, control and management of IRR in the banking book. With the deregulation of interest rates, the volatility of the interest rates has risen considerably. This has transformed the business of banking forever in our country from a mere volume driven business to a business of carefully planning and choosing assets and liabilities to be entered into to achieve targets of profitability.

Did u know? There are two basic approaches to IRR. They are: (i) Earnings Approach, and (ii) Economic Value Approach.

3. ***Market Risk:*** Traditionally, credit risk management was the primary challenge for banks. With progressive deregulation, market risk arising from adverse changes in market variables, such as interest rate, foreign exchange rate, equity price and commodity price has become relatively more important. Even a small change in market variables causes substantial changes in income and economic value of banks. Market risk takes the form of: (a) Liquidity Risk, (b) Interest Rate Risk, (c) Foreign Exchange Rate (Forex) Risk, (d) Commodity Price Risk, and (e) Equity Price Risk

4. ***Liquidity Risk:*** Liquidity risk is defined as the possibility that the bank would not be able to meet the commitments in the form of cash outflows with the available cash inflows. This risk arises as a result of inadequacy of cash available and near cash item including drawing rights to meet current and potential liabilities. Liquidity risk is categorized into two types; (a) Trading Liquidity Risk; and (b) Funding Liquidity Risk.

   Trading liquidity risk arises as a result of illiquidity of securities in the trading portfolio of the bank. Funding liquidity risk arises as a result of the cash flow mismatch and is an outcome of difference in balance sheet strategies pursued by different institutions in the same industry. It is perfectly possible for a few banks to have excess funding liquidity while other banks may suffer shortage of liquidity.

5. ***Operational Risk:*** Operational risk is emerging as one of the important risks financial institutions worldwide are concerned with. Unlike other categories of risks, such as credit and market risks, the definition and scope of operational risk is not fully clear. A number of diverse professions such as internal control and audit, statistical quality control and quality assurance, facilities management and contingency planning, etc., have approached the subject of operational risk thereby bringing in different perspectives to the concept.

Caselet

Financial Risk Management at UBS

Union Bank of Switzerland (UBS) is one of the largest investment managers in the world. UBS serves institutional investors and high net-worth individuals by offering a range of products and services including mutual funds, asset management, corporate finance, and estate planning. UBS also provides securities underwriting services, mergers and acquisitions advice and trades in fixed-income products, and foreign exchange. The company faces many risks. These include interest rate risks, currency risks, equity risks, credit risks, liquidity risks and capital adequacy risks. UBS

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was exposed to market risk, primarily due to trading activities centered in the Corporate and Institutional Clients business of UBS Warburg. Credit risk represented the loss, which UBS would suffer if a client or counterparty failed to meet its contractual obligations. It was inherent not only in traditional banking products but also in foreign exchange and derivatives contracts, such as swaps and options. UBS aimed at ensuring sufficient liquidity to meet its liabilities when due, without compromising its ability to respond quickly to strategic opportunities.

Source: http://www.icmrindia.org

Self Assessment

Fill in the blanks:

1. ……are usually defined by the adverse impact on profitability of several distinct sources of uncertainty.
2. Trading ……risk arises as a result of illiquidity of securities in the trading portfolio of the bank.

5.2 Credit Risk

Simon Hills (2004) of the British Bankers Association defines credit risk "is the risk to a bank's earnings or capital base arising from a borrower's failure to meet the terms of any contractual or other agreement it has with the bank. Credit risk arises from all activities where success depends on counterparty, issuer or borrower performance".

It can be understood from the above that credit risk arises from a whole lot of banking Credit Risk Management activities apart from traditional lending activity such as trading in different markets, investment of funds, provision of portfolio management services, providing different type of guarantees and opening of letters of credit in favour of customers etc.

Example: Even though guarantee is viewed as a non-fund based product, the moment a guarantee is given, the bank is exposed to the possibility of the non-funded commitment turning into a funded position when the guarantee is invoked by the entity in whose favour the guarantee was issued by the bank.

This means that credit risk runs across different functions performed by a bank and has to be viewed as such. The nature, nomenclature and the quantum of credit risk may vary depending on a number of factors. The internal organization of credit risk management should recognize this for effective credit risk management.

Credit risk can be segmented into two major segments viz. intrinsic and portfolio (or concentration) credit risks. The focus of the intrinsic risk is measurement of risk at individual loan level. This is carried out at lending unit level. Portfolio credit risk arises as a result of concentration of the portfolio to a particular sector, geographic area, industry, type of facility, type of borrowers, similar rating, etc. Concentration risk is managed at the bank level as it is more relevant at that level.

Credit Risk is the potential that a bank borrower/counter party fails to meet the obligations on agreed terms. There is always scope for the borrower to default from his commitments for one or the other reason resulting in crystallisation of credit risk to the bank.

These losses could take the form outright default or alternatively, losses from changes in portfolio value arising from actual or perceived deterioration in credit quality that is short of default.

Notes

Credit risk is inherent to the business of lending funds to the operations linked closely to market risk variables. The objective of credit risk management is to minimize the risk and maximize bank's risk adjusted rate of return by assuming and maintaining credit exposure within the acceptable parameters. Credit risk consists of primarily two components, viz

- Quantity of risk, which is nothing but the outstanding loan balance as on the date of default and the quality of risk, viz, the severity of loss defined by both Probability of Default as reduced by the recoveries that could be made in the event of default. Thus credit risk is a combined outcome of Default Risk and Exposure Risk. The elements of Credit Risk is Portfolio risk comprising Concentration Risk as well as Intrinsic Risk and
- Transaction Risk comprising migration/down gradation risk as well as Default Risk. At the transaction level, credit ratings are useful measures of evaluating credit risk that is prevalent across the entire organization where treasury and credit functions are handled. Portfolio analysis help in identifying concentration of credit risk, default/migration statistics, recovery data, etc.

In general, Default is not an abrupt process to happen suddenly and past experience dictates that, more often than not, borrower's credit worthiness and asset quality declines gradually, which is otherwise known as migration. Default is an extreme event of credit migration.

Off balance sheet exposures such as foreign exchange forward contracts, swaps options, etc are classified in to three broad categories such as full Risk, Medium Risk and Low risk and then translated into risk weighted assets through a conversion factor and summed up. The management of credit risk includes (a) measurement through credit rating/scoring, (b) quantification through estimate of expected loan losses, (c) Pricing on a scientific basis and (d) Controlling through effective Loan Review Mechanism and Portfolio Management.

Self Assessment

State whether the following statements are true or false:

3. Credit risk arises from all activities where success depends on counterparty, issuer or borrower performance.
4. Credit risk is a combined outcome of Default Risk and Exposure Risk.
5. Portfolio analysis help in identifying concentration of credit risk, default/migration statistics, recovery data, etc.
6. The objective of credit risk management is to minimize the risk and maximize bank's risk adjusted rate of return by assuming and maintaining credit exposure within the acceptable parameters.

5.3 Managing Credit Risk

Credit Risk Management covers the decision-making process, before the credit decision is made, and the follow-up of credit commitments, plus all monitoring and reporting processes. Credit risk arises from the potential that an obligor is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in economic loss to the bank.

In a bank's portfolio, losses stem from outright default due to inability or unwillingness of a customer or counter party to meet commitments in relation to lending, trading, settlement and other financial transactions. Alternatively losses may result from reduction in portfolio value due to actual or perceived deterioration in credit quality. Credit risk emanates from a bank's

Notes

dealing with individuals, corporate, financial institutions or a sovereign. For most banks, loans are the largest and most obvious source of credit risk; however, credit risk could stem from activities both on and off balance sheet.

In addition to direct accounting loss, credit risk should be viewed in the context of economic exposures. This encompasses opportunity costs, transaction costs and expenses associated with a non-performing asset over and above the accounting loss.

Credit risk can be further sub-categorized on the basis of reasons of default. For instance the default could be due to country in which there is exposure or problems in settlement of a transaction. Credit risk not necessarily occurs in isolation. The same source that endangers credit risk for the institution may also expose it to other risk. For instance a bad portfolio may attract liquidity problem.

In assessing credit risk from a single counterparty, an institution must consider three issues:

- ***Default probability:*** What is the likelihood that the counterparty will default on its obligation either over the life of the obligation or over some specified horizon, such as a year? Calculated for a one-year horizon, this may be called the expected default frequency.
- ***Credit exposure:*** In the event of a default, how large will the outstanding obligation be when the default occurs?
- ***Recovery rate:*** In the event of a default, what fraction of the exposure may be recovered through bankruptcy proceedings or some other form of settlement?

Example: The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organisation.

Banking is nothing but financial intermediation. There are people in the market with surplus capital looking for safe investment opportunities. Simultaneously there are entrepreneurs desirous of building up productive assets but with no matching capital resource. Yet the 'savers' do not want to directly lend to capital seeking entrepreneurs as they are not certain of safety. There can be no risk-free or zero risk oriented business. Risk in its pragmatic sense, therefore, involves both threats that may be materialized and opportunities which can be exploited.

Caselet

Credit Risk Management at J P Morgan

J P Morgan Chase (JP), the second largest financial services company in the US, is exposed to credit risk through its lending, trading and capital market activities. J P's credit risk management practices are designed to preserve the independence and integrity of the risk assessment process. JP has taken various steps to ensure that credit risks are adequately assessed, monitored and managed. In early 2003, JP has combined its Credit Risk Policy and Global Credit Management functions to form Global Credit Risk Management consisting of the five primary functions – Credit Risk Management, Credit Portfolio Group, Policy & Strategic Group, Special Credits Group and Chase Financial Services (CFS) Consumer Credit Management Risk.

Source: http://www.icmrindia.org

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5.3.1 Tools of Credit Risk Management

The instruments and tools, through which credit risk management is carried out, are detailed below:

1. ***Exposure Ceilings:*** Prudential Limit is linked to Capital Funds – say 15% for individual borrower entity, 40% for a group with additional 10% for infrastructure projects undertaken by the group, Threshold limit is fixed at a level lower than Prudential Exposure; Substantial Exposure, which is the sum total of the exposures beyond threshold limit should not exceed 600% to 800% of the Capital Funds of the bank (i.e. six to eight times).
2. ***Review/Renewal:*** Multi-tier Credit Approving Authority, constitution wise delegation of powers, Higher delegated powers for better-rated customers; discriminatory time schedule for review/renewal, Hurdle rates and Bench marks for fresh exposures and periodicity for renewal based on risk rating, etc are formulated.
3. ***Risk Rating Model:*** Set up comprehensive risk scoring system on a six to nine point scale. Clearly define rating thresholds and review the ratings periodically preferably at half yearly intervals. Rating migration is to be mapped to estimate the expected loss.
4. ***Risk-based scientific pricing:*** Link loan pricing to expected loss. High-risk category borrowers are to be priced high. Build historical data on default losses. Allocate capital to absorb the unexpected loss. Adopt the RAROC framework.
5. ***Portfolio Management*** The need for credit portfolio management emanates from the necessity to optimize the benefits associated with diversification and to reduce the potential adverse impact of concentration of exposures to a particular borrower, sector or industry. Stipulate quantitative ceiling on aggregate exposure on specific rating categories, distribution of borrowers in various industry, business group and conduct rapid portfolio reviews. The existing framework of tracking the non-performing loans around the balance sheet date does not signal the quality of the entire loan book. There should be a proper & regular ongoing system for identification of credit weaknesses well in advance. Initiate steps to preserve the desired portfolio quality and integrate portfolio reviews with credit decision-making process.
6. ***Loan Review Mechanism:*** This should be done independent of credit operations. It is also referred as Credit Audit covering review of sanction process, compliance status, review of risk rating, pick up of warning signals and recommendation of corrective action with the objective of improving credit quality. It should target all loans above certain cut-off limit ensuring that at least 30% to 40% of the portfolio is subjected to LRM in a year so as to ensure that all major credit risks embedded in the balance sheet have been tracked. This is done to bring about qualitative improvement in credit administration. Identify loans with credit weakness. Determine adequacy of loan loss provisions. Ensure adherence to lending policies and procedures. The focus of the credit audit needs to be broadened from account level to overall portfolio level. Regular, proper & prompt reporting to Top Management should be ensured. Credit Audit is conducted on site, i.e. at the branch that has appraised the advance and where the main operative limits are made available. However, it is not required to visit borrower's factory/office premises.

5.3.2 Risk Rating Model

Credit Audit is conduced on site, i.e. at the branch that has appraised the advance and where the main operative limits are made available. However, it is not required to risk borrowers' factory/office premises. As observed by RBI, Credit Risk is the major component of risk management system and this should receive special attention of the Top Management of the bank. The process

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of credit risk management needs analysis of uncertainty and analysis of the risks inherent in a credit proposal. The predictable risk should be contained through proper strategy and the unpredictable ones have to be faced and overcome. Therefore any lending decision should always be preceded by detailed analysis of risks and the outcome of analysis should be taken as a guide for the credit decision. As there is a significant co-relation between credit ratings and default frequencies, any derivation of probability from such historical data can be relied upon. The model may consist of minimum of six grades for performing and two grades for non-performing assets. The distribution of rating of assets should be such that not more than 30% of the advances are grouped under one rating. The need for Credit Risk Rating has arisen due dismantling of State control, deregulation, globalization and allowing things to shape on the basis of market conditions; Indian Industry and Indian Banking face new risks and challenges. Competition results in the survival of the fittest. It is therefore necessary to identify these risks, measure them, monitor and control them. It provides a basis for Credit Risk Pricing i.e. fixation of rate of interest on lending to different borrowers based on their credit risk rating thereby balancing Risk & Reward for the Bank.

The need for the adoption of the credit risk-rating model is on account of the following aspects:

- Disciplined way of looking at Credit Risk.
- Reasonable estimation of the overall health status of an account captured under Portfolio approach as contrasted to stand-alone or asset based credit management.
- Impact of a new loan asset on the portfolio can be assessed. Taking a fresh exposure to the sector in which there already exists sizable exposure may simply increase the portfolio risk although specific unit level risk is negligible/minimal.
- The co-relation or covariance between different sectors of portfolio measures the inter relationship between assets. The benefits of diversification will be available so long as there is no perfect positive correlation between the assets, otherwise impact on one would affect the other.
- Concentration risks are measured in terms of additional portfolio risk arising on account of increased exposure to a borrower/group or co-related borrowers.
- Need for Relationship Manager to capture, monitor and control the over all exposure to high value customers on real time basis to focus attention on vital few so that trivial many do not take much of valuable time and efforts.
- Instead of passive approach of originating the loan and holding it till maturity, active approach of credit portfolio management is adopted through securitisation/credit derivatives.
- Pricing of credit risk on a scientific basis linking the loan price to the risk involved therein.
- Rating can be used for the anticipatory provisioning. Certain level of reasonable over-provisioning as best practice.

Given the past experience and assumptions about the future, the credit risk model seeks to determine the present value of a given loan or fixed income security. It also seeks to determine the quantifiable risk that the promised cash flows will not be forthcoming. Thus, credit risk models are intended to aid banks in quantifying, aggregating and managing risk across geographical and product lines. Credit models are used to flag potential problems in the portfolio to facilitate early corrective action.

Notes

Notes The risk-rating model should capture various types of risks such as Industry/ Business Risk, Financial Risk and Management Risk, associated with credit.

Industry/Business risk consists of both systematic and unsystematic risks which are market driven. The systematic risk emanates from General political environment, changes in economic policies, fiscal policies of the government, infrastructural changes etc. The unsystematic risk arises out of internal factors such as machinery breakdown, labour strike, new competitors who are quite specific to the activities in which the borrower is engaged.

Assessment of financial risks involves appraisal of the financial strength of a unit based on its performance and financial indicators like liquidity, profitability, gearing, leverage, coverage, turnover, etc. It is necessary to study the movement of these indicators over a period of time as also its comparison with industry averages wherever possible. A study carried out in the western corporate world reveals that 45% of the projects failed to take off simply because the personnel entrusted with the test were found to be highly wanting in qualitatively managing the project.

The key ingredient of credit risk is the risk of default that is measured by the probability that default occurs during a given period. Probabilities are estimates of future happenings that are uncertain. We can narrow the margin of uncertainty of a forecast if we have a fair understanding of the nature and level of uncertainty regarding the variable in question and availability of quality information at the time of assessment.

The expected loss/unexpected loss methodology forces banks to adopt new Internal Ratings Based approach to credit risk management as proposed in the Capital Accord II. Some of the risk rating methodologies used widely is briefed below:

1. Altman's Z score Model involves forecasting the probability of a company entering bankruptcy. It separates defaulting borrower from non-defaulting borrower on the basis of certain financial ratios converted into simple index.
2. Credit Metrics focuses on estimating the volatility of asset values caused by variation in the quality of assets. The model tracks rating migration which is the probability that a borrower migrates from one risk rating to another risk rating.
3. Credit Risk +, a statistical method based on the insurance industry, is for measuring credit risk. The model is based on actuarial rates and unexpected losses from defaults. It is based on insurance industry model of event risk.
4. KMV, through its Expected Default Frequency (EDF) methodology derives the actual probability of default for each obligor based on functions of capital structure, the volatility of asset returns and the current asset value. It calculates the asset value of a firm from the market value of its equity using an option pricing based approach that recognizes equity as a call option on the underlying asset of the firm. It tries to estimate the asset value path of the firm over a time horizon.

   The default risk is the probability of the estimated asset value falling below a pre-specified default point.
5. McKinsey's credit portfolio view is a multi factor model which is used to stimulate the distribution of default probabilities, as well as migration probabilities conditioned on the value of macro economic factors like the unemployment rate, GDP growth, forex rates, etc.

In today's parlance, default arises when a scheduled payment obligation is not met within 180 days from the due date and this cut-off period may undergo downward change. Exposure risk is

Notes

the loss of amount outstanding at the time of default as reduced by the recoverable amount. The loss in case of default is D* X * (I-R) where D is Default percentage, X is the Exposure Value and R is the recovery rate.

Credit Risk is measured through Probability of Default (POD) and Loss Given Default (LGD). Bank should estimate the probability of default associated with borrowers in each of the rating grades. How much the bank would lose once such event occurs is what is known as Loss Given Default. This loss is also dependent upon bank's exposure to the borrower at the time of default commonly known as Exposure at Default (EaD). The extent of provisioning required could be estimated from the expected Loss Given Default (which is the product of Probability of Default, Loss Given Default & Exposure & Default). That is ELGD is equal to POD × LGD × EaD.

Credit Metrics mechanism advocates that the amount of portfolio value should be viewed not just in terms of likelihood of default, but also in terms of credit quality over time of which default is just a specific case.

Credit Metrics can be worked out at corporate level, at least on an annual basis to measure risk-migration and resultant deterioration in credit portfolio.

The ideal credit risk management system should throw a single number as to how much a bank stands to lose on credit portfolio and therefore how much capital they ought to hold.

Case Study

Credit Risk Management at ABN AMRO

Holland's leading bank, ABN AMRO operates more than 800 offices at home and another 2,600 in 75 other countries. In the US, ABN AMRO owns Chicago-based LaSalle Bank and Standard Federal Bank, one of Michigan's largest banks. ABN AMRO's comprehensive risk management framework aims at combining centralized policy setting with broad oversight, supported by risk execution and monitoring in the Group's network. ABN AMRO's goal is to identify and analyze risks at an early stage; to set and monitor prudent limits; and to learn and evolve continuously to help it face a volatile and rapidly-changing risk environment. ABN also had a large presence in Brazil (through its ownership of Banco Real and Paraiban) and Malaysia (where it had operated for more than 100 years). The bank was expanding its presence in the Philippines, India, Singapore, Taiwan, and Thailand. The case discusses in detail how ABN manages credit risk.

ABN had three major business segments: private clients & asset management, consumer and commercial clients, and wholesale clients, but its strategic focus was on the mid-market segment. Each of ABN's Strategic Business Units (SBUs) was responsible for managing a distinct client segment or product segment, while also sharing expertise and operational excellence across the Group. ABN's comprehensive risk management framework aimed at combining centralized policy setting with broad oversight, supported by risk execution and monitoring in the Group's network.

The Managing Board established the strategic risk philosophy and policies for ABN under the oversight of the Supervisory Board. Responsibility for the overall implementation of risk policy lay with the CFO, who was a member of the Managing Board. ABN had established an Asset and Liability Committee (ALCO) structure mirroring the bank's organization. Under this structure there was a Group ALCO at Group level and an ALCO in its client-facing business units, each responsible for managing the Asset and Liability Management (ALM) process in its own particular area of interest.

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The Group Risk Committee (GRC), who's voting members were drawn mainly from GRM, was the most senior committee on policy and exposure approval for credit, country and market risk. Despite the creation of the formal GRM organization, ABN viewed more broadly as the responsibility of all departments in the bank. So risk was taken into account from the inception of a transaction through to its completion.

Question

What is the process of credit risk management by ABN AMRO? Also discuss the risk framework of the company.

Source: http://www.icmrindia.org

5.3.3 Principles for the Management of Credit Risk

While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties. This experience is common in both G-10 and non-G-10 countries. For most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet.

Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions. Since exposure to credit risk continues to be the leading source of problems in banks worldwide, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred.

The Basel Committee is issuing this document in order to encourage banking supervisors globally to promote sound practices for managing credit risk. Although the principles contained in this paper are most clearly applicable to the business of lending, they should be applied to all activities where credit risk is present.

The sound practices set out in this document specifically address the following areas: (i) establishing an appropriate credit risk environment; (ii) operating under a sound credit-granting process; (iii) maintaining an appropriate credit administration, measurement and monitoring process; and (iv) ensuring adequate controls over credit risk. Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program will address these four areas.

These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk, all of which have been addressed in other recent Basel Committee documents. While the exact approach chosen by individual supervisors will depend on a host of factors, including their on-site and off-site supervisory techniques and the degree to which external auditors are also used in the supervisory function, all members of the Basel Committee agree that the principles set out in this paper should be used in evaluating a bank's credit risk management system. Supervisory expectations for the credit risk management approach used by individual banks should be

commensurate with the scope and sophistication of the bank's activities. For smaller or less sophisticated banks, supervisors need to determine that the credit risk management approach used is sufficient for their activities and that they have instilled sufficient risk-return discipline in their credit risk management processes.

A further particular instance of credit risk relates to the process of settling financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction. Even if one party is simply late in settling, then the other party may incur a loss relating to missed investment opportunities.

Settlement risk (i.e. the risk that the completion or settlement of a financial transaction will fail to take place as expected) thus includes elements of liquidity, market, operational and reputational risk as well as credit risk. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include: the timing of the exchange of value; payment/settlement finality; and the role of intermediaries and clearing houses.

Self Assessment

Fill in the blanks:

7. Losses may result from reduction in ……value due to actual or perceived deterioration in credit quality.
8. Credit Risk is the major component of ……system and this should receive special attention of the Top Management of the bank.
9. The …….risk arises out of internal factors such as machinery breakdown, labour strike, new competitors who are quite specific to the activities in which the borrower is engaged.
10. ……mechanism advocates that the amount of portfolio value should be viewed not just in terms of likelihood of default, but also in terms of credit quality over time of which default is just a specific case.

5.4 Approaches to Credit Risk Measurement: Intrinsic Risk

There are three basic approaches to credit risk measurement at individual loan intrinsic level that are used for various types of loans such as commercial loans, project and infrastructure finance, consumer and retail loans. They are:

- Expert Systems,
- Credit Rating, and
- Credit Scoring.

5.4.1 Expert Systems

In an expert system, the decision to lend is taken by the lending officer who is expected to possess expert knowledge of assessing the credit worthiness of the customer. Accordingly the success or failure very much depends on the expertise, judgment and the ability to consider relevant factors in the decision to lend.

One of the most common expert systems is the five "Cs" of credit. The five 'C' are as under (Saunders, 1999):

Notes

- ***Character:*** Measure of reputation of the firm, its willingness to repay and the repayment history.
- ***Capital:*** The adequacy of equity capital of the owners so that the owner's interest remains in the business. Higher the equity capital betters the creditworthiness.
- ***Capacity:*** The ability to repay is measured by the expected volatility in the sources of funds intended to be used by the borrower for the repayment of loan along with interest. Higher the volatility of this source, higher the risk and vice versa.
- ***Collateral:*** Availability of collateral is important for mitigating credit risk. Higher the value of the collateral, lower would be the risk and vice versa.
- ***Cycle or (economic) Conditions:*** The state of the business cycle is an important element in determining credit risk exposure. Some industries are highly dependent on the economic condition while the others are less dependent or independent. Higher the dependence, higher the risk as during recessionary period of the economy, the cyclic industries would suffer and vice versa. Industries such as FMCG, pharmaceuticals, etc. are less dependent on economic cycles than industries such as consumer durable, steel, etc.

The expert view on the above would finally influence the decision to lend or not. Although many banks still use expert systems as part of their credit decision process, these systems face two main problems (Saunders, 1999):

- ***Consistency:*** There may not be a consistent approach followed for different types of borrowers and industries. Thereby the system would be person-dependent.
- ***Subjectivity:*** As weights applied to different factors are subjective, comparability across time may not be possible.

5.4.2 Credit Rating

Credit Rating is the most popular method at present among banks. Rating is the process by which an alphabetic or numerical rating is assigned to a credit facility extended by a bank to a borrower based on a detailed analysis of his character and matching it with the characteristics of facility that is extended to him.

The rating carried out by a bank is very much similar to the credit rating carried out by external rating agencies such as CRISIL, ICRA, etc. The only difference is that while the rating by the external agency is available in the public domain for any one to use, the internal ratings carried out by a bank is confidential and is used for specific purpose only. Moreover, the internal ratings of banks are usually finer than the ratings of rating agencies. This is to facilitate better distinction between credit qualities and pricing of loan in an accurate manner.

5.4.3 Credit Scoring

A major disadvantage of a rating model is the subjectivity of weight to be applied to different segments in the rating exercise. This drawback can be avoided in a scoring model which is based on rigorous statistical techniques.

This approach combines a number of ratios into a single numerical score which is used to determine the credit quality or default. The basic assumption of the method is that combination of a number of ratios explains the success (no default) or failure (default) of a facility extended to a borrower. Starting with the historical data with known outcome of success or failure, a set of ratios that differentiate the successful cases from the failed ones along with the weights to be applied for each ratio is arrived at by multiple discriminant analysis. The most popular among the models is the one by Altman's (1968) Z-score model, which is a classificatory model for corporate borrowers.

Self Assessment

Notes

State whether the following statements are true or false:

11. In an expert system, the decision to lend is taken by the lending officer who is expected to possess expert knowledge of assessing the credit worthiness of the customer.
12. Rating is the process by which an alphabetic or numerical rating is assigned to a credit facility extended by a bank to a borrower.

5.5 Summary

- Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty. Risk Management is a discipline at the core of every financial institution and encompasses all the activities that affect its risk profile.
- A risk management framework encompasses the scope of risks to be managed, the process/ systems and procedures to manage risk and the roles and responsibilities of individuals involved in risk management.
- Credit risk arises from the potential that an obligor is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in economic loss to the bank. Credit risk can be segmented into two major segments viz. intrinsic and portfolio (or concentration) credit risks.
- Credit Risk Management covers the decision-making process, before the credit decision is made, and the follow-up of credit commitments, plus all monitoring and reporting processes.
- Credit Audit is conduced on site, i.e. at the branch that has appraised the advance and where the main operative limits are made available. However, it is not required to risk borrowers' factory/office premises.
- Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions.
- There are three basic approaches to credit risk measurement at individual loan intrinsic level that are used for various types of loans such as commercial loans, project and infrastructure finance, consumer and retail loans.

5.6 Keywords

Credit risk: Credit risk is the risk that a borrower will not repay a loan according to the terms of the loan, either defaulting entirely or making late payments of interest or principal.

Expected losses: Expected losses are those that the bank knows with reasonable certainty will occur and are typically reserved for in some manner.

Interest Rate Risk: Interest Rate Risk (IRR) arises as a result of change in interest rates on rate earning assets and rate paying liabilities of a bank.

Liquidity Risk: Liquidity risk is defined as the possibility that the bank would not be able to meet the commitments in the form of cash outflows with the available cash inflows.

Operational Risk: Operational risk is emerging as one of the important risks financial institutions worldwide are concerned with.

Notes

Risks: Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty.

Unexpected losses: Unexpected losses are those associated with unforeseen events.

5.7 Review Questions

1. What is risk? Discuss risk management.
2. Write down the functions of risk management.
3. What are the various categories of risk?
4. Describe credit risk.
5. What are the tools of credit risk management?
6. What are the principles for the management of credit risk?
7. Briefly explain the approaches to credit risk measurement.

Answers: Self Assessment

1.	Risks	2.	Liquidity
3.	True	4.	True
5.	True	6.	True
7.	Portfolio	8.	Risk management
9.	Unsystematic	10.	Credit Metrics
11.	True	12.	True

5.8 Further Readings

Books

Caouette, Altman, and Narayanan (1998), "Managing Credit Risk: The Next Great Financial Challenge", John Wiley & Sons, New York

Saunders (1999), "Credit Risk Measurement: New Approaches to Value at Risk and Other Paradigms", John Wiley & Sons, Inc.

Simon Hills (2004), "Explaining Credit Risk Elements in Basel II", in The Basel Handbook: A Guide for Financial Practitioners, (Ed.,) Michael Ong, Risk Books

Subramanian and Umakrishnan (2004), "Is Bank Debt Special? An Empirical Analysis of Indian Corporates", Economic and Political Weekly, Vol. XXXIX, No. 12, March 20, 2004

Online links

www.bis.org/

www.creditriskmgt.com

www.crisil.com

Notes

Unit 6: Managing Collection and Disbursement of Working Capital

CONTENTS

Objectives

After studying this unit, you will be able to:

- Explain the disbursement and follow up of working capital finance by bank
- Discuss the controlling disbursements
- Know how to find the optimal working balance

Introduction

Managing working capital means controlling the collection, disbursement, and investment of cash. When it comes to managing working capital, time is money. Business managers must consider collection time and procedures, disbursement float, positive uses for idle cash including

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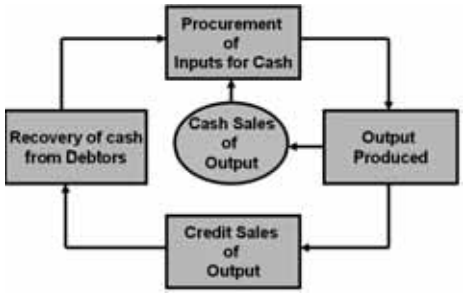
holding versus investing, and credit policies. Working capital management is the management of cash, accounts receivable, inventories, accounts payable and short-term investments. All of these items comprise the heart of an organization. Working capital management is a very important part of the current business environment. Successful working capital management can reduce costs, utilize inventory, raise profits, and increase shareholder value.

6.1 Disbursement and Follow Up of Working Capital Finance by Bank

To size up our problem of cash management, let us examine the flow of cash through a firm's accounts. It is useful to think of the process as cycle in which cash is used to procure inputs, from which output is produced, which are then sold to customers, who later pay their bills. The firm receives cash from its customers and the cycle repeats.

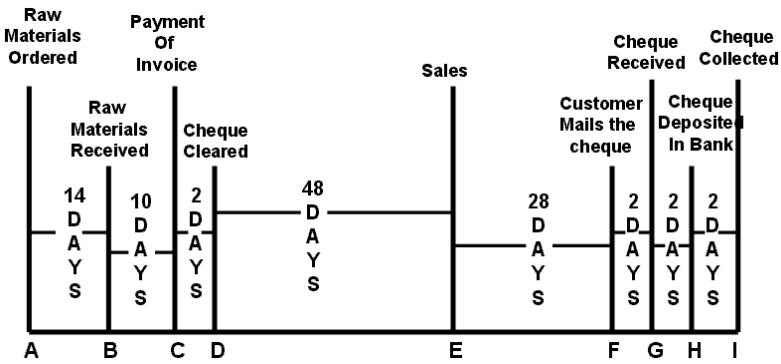
Figure 6.1: Cash Cycle



Opportunities to improve efficiency in collecting and disbursing funds centre on flows through the current section of the balance sheet.

Example: Let us assume that XYZ Corporation orders raw materials at point A and receives those 14 days later at B. Terms of 2/10, net 30 are offered, so the firm pays the invoice 10 days later at C. However, it takes 2 days for the cheque to clear, and XYZ's bank account is not debited until point D. XYZ turns over its inventory six times per year, so 60 days after the materials are received, the product is sold and the customer is billed, the collection period is 30 days, 28 for the customer to pay and 2 for the cheque to arrive by mail (G). XYZ processes the payment and deposits it 2 days later at H. Another 2 days elapse while XYZ's bank collects the funds from the customer's bank.

Figure 6.2: Working Capital Cycle of a Typical Manufacturing Firm



The firm's total financing requirements are affected by the total time lag from point B to point I (from Figure 6.2). The firm itself can control some factors that determine the various lags,

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but some it cannot. Some of the lags affect the cash balance, while others affect other components of working capital such as accounts receivable and inventory. In addressing ourselves to Cash management, we are concerned with time periods BCD and FGHI. Time period AB is beyond the firm's control and does not directly affect its financial statements, although it may affect production schedules. Time period BE is determined by the firm's production process and inventory policy, and affects the total investment in inventory. Time period EF is determined by the firm's credit terms and the payment policies of its customers, and affects the total investment in accounts receivable.

Our present task is to examine what can be done to improve the efficiency of a firm's cash management. We will focus on three areas: concentrating working balances, speeding collections, and controlling disbursements.

6.1.1 Concentrating Banking

Many firms need only a single bank account. Larger firms that operate over wide geographical areas usually need more than one, sometimes dozens. Where many accounts are needed, concentration accounts can be used to minimise the total requirement for working balances. Suppose a company has a number of branch offices, each with a local bank account. Branches collect accounts receivable and make deposits in their local accounts. Each day, funds above a certain predetermined minimum level are transferred to a central concentration account, usually at the firm's headquarters.

Notes The daily transfer of funds can be made either by a depository transfer check or by Fax/TT; the latter is faster but more expensive.

The funds transferred to the concentration account are available for disbursements and for other purposes. As we will see later, the more variable a firm's cash flows, the higher the requirement for working cash balances.

Caution By pooling its funds for disbursement in a single account, the aggregate requirement for working balances is lower than it would be if balances were maintained at each branch office. Concentration in short, permits the firm to "store" its cash more efficiently.

6.1.2 Speeding Collections

Another means of conserving cash is to reduce the lag between the time the customer mails the cheque and the time the funds become collected, that is, from points F to I in Figure 6.2. Of the 6 days lag in Figure 6.2, 2 days are due to mail time, 2 days are due to processing time within XYZ Corporation, and 2 days are due to collection time required by the bank. We will have more to say later about collection within the banking system. Let us now focus on the 4 days lag from F to H.

Small firms that operate over scattered geographical areas can often do little to reduce mail time. However, improvements can be made in processing time within the firm. Suppose XYZ Corporation has credit sales of ₹5 crore per year. With approximately 250 working days per year, XYZ's collections average ₹ 2,00,000 per working day. If XYZ could reduce such credit sales even by ₹ 20,000, (XYZ's borrowing cost was 9 per cent) saving of about ₹ 1,800 per year would be realised. This potential saving could be compared to the cost of faster processing to determine

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whether the change in processing should be made. We can conclude that internal processing should be speeded up to the point at which the costs of further improvement exceed the savings.

A second step that may be advantageous is to establish a lock-box system, which often can reduce mail and processing time still further. The firm first establishes a number of collection points, taking account of customer locations and mail schedules. At each location, the firm rents a post office box and instructs its customers to remit to the box. The firm's local bank is authorised to pick up mail directly from the box. The bank does so, perhaps several times a day and deposits the cheques in the firm's account. The bank's computerized system prepares a record of names and amounts and other data needed by the firm for internal accounting purpose, even as it enters the cheques for collections/clearing on the respective schedules.

The lock-box system results in two benefits to the firm. First, the bank performs the clerical tasks of handling the remittances prior to deposit, services which the bank may be able to perform at lower cost. Second, and often more important, the process of collection through the banking system begins immediately upon receipt of the remittance and does not have to wait until the firm completes its processing for internal accounting purpose. In terms of the activities in Figure 6.2, the activity represented by HI now takes place simultaneously with GH. The firm processes remittances for internal accounting purpose using data supplied by the bank and can schedule this processing at any time without delaying collection. Using lock-box systems, as much as 4 days in mailing and processing time can be reduced.

Did u know? Banks charge for their services in connection with a lock-box plan either via fees or compensating balance requirements. Whether the savings will outweigh the costs for a particular company depends mainly on the geographical dispersion of customers, the amount of the average remittance, the firm's cost of financing.

We see that a major advantage of speeding collections is freeing of blocked cash and thereby reduction in the firm's total financing requirements. There are other advantages as well. By transferring clerical functions to the bank, the firm may reduce its costs, improve internal control, and reduce the possibility of fraud. By getting cheques to banks on the day when they are written dropped or soon thereafter, the incidence of cheques getting dishonoured for insufficient funds in the drawers' accounts may be reduced.

Task On the basis of the above discussion, analyse and discuss why speeding collections important.

6.1.3 Collection Time in the Banking System

We have made several references to the time required to collect a cheque through the banking system (HI in Figure 6.2) but we have made no proposals to shorten it. Let us look at the process of cutting down the collection time in the banking system.

Example: Suppose a customer in New Delhi, purchases electronics equipment from a firm in Mumbai, and remits a cheque drawn on a New Delhi Bank. The seller deposits the cheque in a bank in Mumbai, but the funds are not available for use until the cheque has been presented physically to the New Delhi bank, a process that depends on mail service between the two cities and may take several days. A very extensive clearing network has been established in India that involves the commercial banks and the RBI. In the majority of cases, collection times have been

reduced to 2 days or less using the facilities of the direct interbank clearing. In the matter of cheque clearing, the banks are the experts, and firms usually can rely on their banks to minimise the time requirements. Time norms for outstation collections (clearing is basically a local phenomenon) have been laid down by RBI, ranging from ten days from metro-to-metro collections, to about 3 weeks in case of remote branches in the interior. Banks not staying within these parameters are likely to face RBI censure, or adverse comments from auditors.

Self Assessment

State whether the following statements are true or false:

1. The firm itself can control some factors that determine the various lags, but some it cannot.
2. The funds transferred to the concentration account are available for disbursements and for other purposes.
3. By transferring clerical functions to the bank, the firm may reduce its costs, improve internal control, and reduce the possibility of fraud.

6.2 Controlling Disbursements

Just as speeding up collections turns accounts receivable into cash as soon as possible, thereby reducing the firm's financing requirements, slowing disbursements also has the same effect. There, we concluded that the proper policy was to pay within the terms agreed upon, and taking cash discounts when offered. We also concluded that there is no point in paying sooner than agreed. By waiting as long as possible, the firm maximises the extent to which accounts payable are used as a source of funds, a source which requires no interest payment.

Firms with expense-generating activities over a wide area often find it advantageous to make disbursements from a single central account. In that way, schedules can be tightly controlled and disbursements can be made on exactly the right day. An alternate arrangement is to disburse from decentralised locations, but to wire transfer the exact amount needed in each local account for all disbursements scheduled that day needs to be ascertained accurately by the Finance Department at the Head Office.

Some firms find it advantageous to exploit the "cheque book float", which is the time between the writing of a cheque and its presentation for collection, represented by CD in Figure 6.2. If this lag can be exploited, it offsets at least partially the lag in the other direction in collecting cheques from customers (HI). Because of lag CD, a firm's balance on the bank's books is higher than in its own cheque book. Knowing this, a firm may be able to reduce its working cash requirements. Banks understand cheque book float also, and can be expected to set compensating balances and fees based on balances on their (the banks) books. If a firm exploits cheque book float too far, it increases the likelihood of cheques being dishonoured for insufficient funds and the accompanying displeasure of both bank and payee.

6.2.1 Determining the Appropriate Working Cash Balance

Let us assume the firm is now collecting, and disbursing its cash as efficiently as possible. Given its long-term financial structure and fixed assets, its total cash position at any time is determined by its operating plan. If a firm's total cash is more than what it needs for operating purposes, it would be faced with a surplus working capital position. The Neptune Company projected a total cash balance as high as ₹ 4,89,000 in November. Should all these funds be kept in Neptune's current account?

Notes

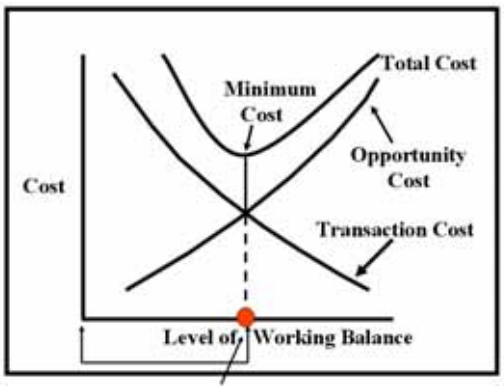
Since current accounts earn no interest, it is to Neptune's advantage to leave only the amount necessary to operate, and to invest the remainder temporarily in interest-bearing liquid assets until needed.

Our problem, then, is to determine how much cash a firm should maintain in its current account as a working balance.

The working balance is maintained for transaction purposes like paying bills. If the firm maintains too small a working balance, it may run out of cash. It then must liquidate marketable securities, if available, or borrow. Liquidating marketable securities and borrowing, both involve transaction costs.

If, on the other hand, the firm maintains too high a working balance, it foregoes the opportunity to earn interest on marketable securities, that is, it incurs what economists refer to as an 'opportunity cost'. Thus, the answer we seek is the optimal working balance, rather than the minimum. Finding the optimum involves a trade-off of transaction costs against opportunity costs. If a firm tries to keep its working balances low, it will find itself selling securities (and later repurchasing securities) more often than if it aims at a higher level of working balances, that is, transaction costs fall as the working balance level rises. Opportunity costs, on the other hand, rise as the level of working balances rises. There is one point where the sum of the two costs is at a minimum as shown in Figure 6.3. This is the optimal level of working balance that efficient management should try to find.

Figure 6.3: Optimal Level of Working Balance



6.2.2 Compensating Balance Requirements

If a firm uses bank credit as a source of financing, the question of the optimal current account balance may have a simple answer: it may be dictated by its compensating balance requirements to compensate for various services such as processing cheques and standby commitments to lend.

In some cases, a firm may determine with very little analysis that its optimal working balance is below the bank's compensating balance requirement. In such cases, the latter figure becomes the firm's minimum current account balance. In other cases, where the answer is not so clear or where compensating balances are not required, we must put pencil to paper to determine the appropriate working balance.

Notes

Caselet

Coca-Cola Working Capital

Coco-Cola is a publicly held company that has reported profits over its lifespan. Although the company has reported losses in some years, this has not prevented the company from expanding. Every company has room for improvement and advancement within its respective market. The company has indicated profits over the last two years, 2008 and 2009. Using the information provided by Coco-Cola's financial statements, certain recommendations can be presented to improve the company's operating cycle.

Financial decision and operating cycle recommendations need to be considered with great discussion and understanding. It is important to understand the impact these recommendations will have on the organizations overall working capital. The working capital of a company is defined as the current assets minus liabilities; this "measures how much in liquid assets a company has available to build its business" (N.A., 2010). Based on the financial statements and the figures calculated for Coca-Cola, the company has a good working capital that allows it to improve operations and expand its business. The increase in the accounts receivable period caused a slight increase on the accounts payable period.

Self Assessment

State whether the following statements are true or false:

4. The firm can never maximises the extent to which accounts payable are used as a source of funds, a source which requires no interest payment by waiting as long as possible.
5. The working balance is maintained for transaction purposes like paying bills.
6. Finding the optimum involves a trade-off of transaction costs against opportunity costs.

6.3 Finding the Optimal Working Balance

Having done all we can to improve our collection and disbursement procedures, let us now take the pattern of receipts and disbursements as given. Over any time period, a firm's beginning and ending cash balances are related as follows:

Ending balance = Beginning balance + Receipts – Disbursement

If receipts and disbursements were constant each day, we would know with certainty the amount of each component daily and our problem would be simple. Since receipt always would exceed disbursements by the same amount, we could withdraw the ending balance each day and use it for other purposes. In practice, we have two problems: variability and uncertainty. In most firms, receipts and disbursements vary both over the month and over the year. Over a month, receipts and disbursements for current operating expenses are likely to show some variation, perhaps in a regular pattern. In seasonal firm, the amounts also will vary over the year. Less frequent outlays such as those for capital expenditure, taxes, and dividends, introduce still more variability. Some of this variability may be predictable, but some probably is not. Let us examine these two problems of variability and uncertainty separately.

6.3.1 Variability

Suppose both receipts and disbursements vary and are not synchronised, but the variations are completely predictable. Determining the appropriate working balance in the face of

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non-synchronous but predictable cash flows is a problem of minimising total costs. If we set the balance too low, we incur high transaction costs; one might say we make too many trips to the bank. If we set the balance too high, we lose too much interest on marketable securities.

The determination of the optimal working balance under conditions of certainty can be viewed as an inventory problem in which we balance the costs of too little cash (transaction costs) against the costs of too much cash (opportunity costs). If the cash shortage becomes severe enough, we may begin to forego cash discounts on purchases, adding another element of opportunity cost.

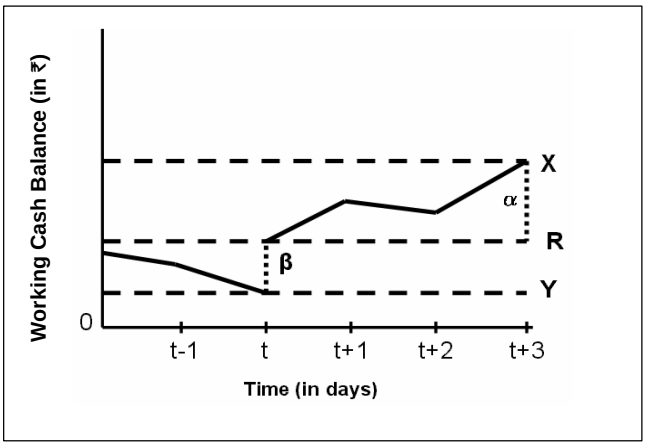
Formal models of the cash balance problem have been developed using inventory theory. Inputs to such a model are the total net cash outflow over the period of time in question, the transaction costs of replenishing the cash balance by selling securities or borrowing, and the interest rate that can be earned on securities. The answer given by the model tells us how often and in what amounts funds should be transferred to the checking account from other sources.

6.3.2 Uncertainty

Receipts and disbursements are very seldom completely predictable. If we go to the opposite extreme and assume receipts and disbursements, or the difference between them, to be completely random, a different kind of model can be developed using the technique of control theory. In addition to information on transaction costs and interest rates on securities, we need a measure of the variability of net cash flows. Using these data, we can determine the optimal maximum and minimum balances in the firm's checking account, denoted by levels X and Y in Figure 6.4

In Figure 6.4, the firm's working cash balance fluctuates randomly in response to random inflows and outflows. At time t, the balance reaches the lower control limit Y. At that point, (Y – β) value of marketable securities is sold and the proceeds transferred to the working balance. Such a transaction brings the firm's working cash balance to the return point (R). The balance continues to fluctuate, gradually rising to the maximum level X at t + 3. At this point, (X – a) amount of cash is invested in marketable securities and the firm's working cash balance comes down to the level of return point (R) again. The control limit model thus gives an answer in terms of maximum and minimum balances and provides a decision rule, rather than a fixed schedule of transfers as done in the simple inventory model. One of the important insights of the control limit model is that, where cash flows are uncertain, the greater the variability the higher the minimum balance (X in Figure 6.4).

Figure 6.4: Control Limits Approach to Determine the Working Cash Balance



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6.3.3 Using Mathematical Models

Formal mathematical models such as those mentioned above are useful for increasing our understanding of the cash management problem and providing insights and qualitative guidance. The models tell us which factors are important and make the trade-offs explicit.

Caution Transaction costs play a central role. If transaction costs were zero, the firm would require no working cash balance at all; it simply would sell securities or borrow to pay every bill.

Are formal mathematical models also useful for quantitative applications? In practice, the cash flow patterns of most firms are partly predictable and partly random. Neither the inventory model nor the control limit model is strictly applicable. By combining the insights from formal models with the techniques of cash budgeting and pro forma analysis, many firms can arrive at reasonable answers by experience and experiment. In deciding how far to go in analysing the problem, we must consider the cost of the analysis. Except in the case of very large firms, quantitative solutions to the cash balance problem using formal mathematical models are likely to be uneconomical. Often, the cost of obtaining the necessary input data and operating the model exceeds the savings over solutions that can be attained by experience and experiment. As always, we must keep an eye on the cost of our analytical techniques as well as on the benefits.

6.3.4 Planning Cash Requirement

In most cases, to search for the optimal working cash balance probably overstates our capabilities; we must be content to get reasonably close. Perhaps we should substitute the word "appropriate" for "optimal."

The current account balance that the firm should maintain is the compensating balance requirement or the optimal working balance, whichever is greater. Some firms, especially those with seasonal sales patterns, may find that the appropriate working balance varies somewhat over the year. As a firm grows, the appropriate working cash balance will also grow, although probably not proportionally.

Once we have settled on the appropriate balance to be maintained in the current account, we can integrate cash management into the financial planning process. The projected current account balance goes into the pro forma balance sheet. Any excess cash over that figure may then be invested in interest-bearing assets.

6.3.5 Investing Idle Cash

Cash in excess of requirements for working balances normally is invested in interest-bearing assets that can be converted readily into cash. A firm might hold excess cash for two principal reasons; first, the firm's working capital requirement may vary over the year, perhaps in a fairly predictable manner if the variation is due to recurring seasonal factors. From the pro forma balance sheet, it was apparent that excess cash would build up during seasonal lows in accounts receivable and inventory, and would be needed later to finance a re-expansion of receivables and inventory during the next seasonal high. We can view the excess cash as a part of the firm's transaction balances. Even though the cash is temporarily idle, there is a predictable requirement for it later. Second, excess cash may be held to cover unpredictable financing requirements. In a world of uncertainty, cash flows can never be predicted with complete accuracy. Competitors act, technology changes, products fail, strikes occur, and economic conditions vary. On the positive side, attractive investment opportunities may suddenly appear. A firm may choose to

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hold excess cash to finance such needs if and when they occur. We noted earlier that cash held for such purposes is referred to as a precautionary balance and is usually invested in interest-bearing assets until needed.

An alternative exists to the holding of excess cash for either of the two purposes described above. The firm can simply borrow short-term to finance variable requirements as they arise. Under such a policy, the firm would never hold excess cash. A firm's choice between short-term borrowings versus liquid assets as a means of financing variable requirements will depend on policy decisions with respect to the firm's long-term financial structure, particularly the mix of short-term and long-term funds. We will discuss overall financial structure and the relationship between maturity structure and liquidity later. Here, we take as given the long-term structure and the amount available for investment in interest-bearing assets.

6.3.6 Investment Criteria

A firm might invest excess cash in many types of interest-bearing assets. To choose among the alternatives, we must establish criteria based on our reasons for investing excess cash in the first place. We are investing either temporary transaction balances or precautionary balance or both. When we need the cash, we want to be able to obtain it – all of it – quickly. Given these objectives, we can rule out equity shares and other investments with returns that are not contractual and with prices that often vary widely. Debt securities, with a contractual obligation to pay, are our best candidates. In selecting among debt securities, there are three principal characteristics we should examine: default risk, maturity and marketability.

Default risk refers to the possibility that interest or principal might not be paid on time and in the amount promised. If the financial markets suddenly perceive a significant risk of default on a particular security, the price of such a security is likely to fall substantially, even though default may not have actually occurred. Investors in general are averse to risk, and the possibility of default is sufficient to depress the price. Given our purposes in investing excess cash, we want to steer clear of securities that stand any significant chance of defaulting. In an uncertain world, although there is no guarantee against the default risk, still there are securities available with sufficiently low, almost negligible, default risk. In selecting securities, we must keep in mind that risk and return are related, and that low-risk securities provide the lowest returns. We must give up some return in order to purchase safety.

Maturity refers to the time period over which interest and principal payments are to be made. A 20-year bond might promise interest semiannually and principal at the end of the twentieth year. A 6-month bank certificate of deposit would promise interest and principal at the end of the sixth month.

The prices of fixed-income securities vary with the interest rates. A rise in market rates produces a fall in price, and vice versa. Because of this relationship, in addition to default risk, debt securities are subject to a second type of risk – interest rate risk. A government bond, though free of default risk, is not immune to interest rate risk. The longer the maturity of a security, the more sensitive its price is to interest rate changes and the greater its exposure is to interest rate risk. For this reason, short maturities are generally best for investing excess cash.

Marketability refers to the ease with which an asset can be converted into cash. With reference to financial assets, the terms 'marketability' and 'liquidity' are often used interchangeably. Marketability has two principal dimensions – price and time – that are interrelated. If an asset can be sold quickly in large amounts at a price that can be determined in advance within narrow limits, the asset is said to be highly marketable or highly liquid. Perhaps the most liquid of all financial assets are Treasury Bills. On the other hand, if the price that can be realised depends significantly on the time available to sell the asset, the asset is said to have low liquidity. The more independent the price is of time, the more liquid the asset. Besides price and time, a third attribute of marketability is low transaction costs.

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6.3.7 Yields

All the characteristics we discussed above – default risk, maturity, and marketability – affect yield. In general, lower the default risk and better the marketability, lower the yield. Securities with these desirable characteristics have higher prices, and since price and yield are inversely related lower yields.

The relationship between maturity and yields is more complex and changes over time. On an average, short maturity securities yield less, other factors being equal, because they are subject to less interest rate risk. Rates on short maturities, however, are more volatile than those on longer maturities, and at times exceed the latter.

At any point in time, rates on the major types of money-market securities discussed above are fairly close to one another. For equal maturities, the differentials usually are small and are due to small differences in default risk and marketability. Over time, the entire structure of short-term rates varies significantly. Such variations are related to the business and monetary cycles, the demand for funds by individuals and firms, and the credit policies of the RBI.

Case Study

Cytec Industries

Cytec Industries Inc. is a global specialty chemicals and Materials Company focused on developing, manufacturing and selling value-added products. Its products serve a diverse range of end markets including aerospace, adhesive, automotive and industrial coatings, chemical intermediates, inks, mining and plastics. Headquartered in New Jersey, Cytec has operations in more than 35 countries.

Funding Future Growth

In the second half of 2008, Cytec foresaw a strong downward trend in the economy and its business activity. Cytec's businesses tend to be cyclical, although not all fit in the same part of the economic cycle. Senior management knew that focusing on cash would be critical to riding out the coming downturn and positioning the company for an eventual recovery. The market having reduced its share price; Cytec needed to amend its bank facility covenants and wanted to take the proactive step of refinancing senior debt due in 2010 by the end of the third quarter of 2009. So the pressure was on to demonstrate to the capital markets that Cytec could continue to generate cash through the downturn in the business cycle.

Cytec's working capital levels had been increasing year-over-year as a result of growth and acquisitions. The company compared poorly to the industry peer group. Cytec's own analysis showed excess working capital of more than $200 million. When markets were strong, the focus had been on earnings rather than the balance sheet. Understanding the downward trend in the business cycle, the company's management team realized that better working capital management would be the most effective lever to boost cash generation.

"We recognized the opportunity to tap excess working capital to invest in the businesses that will shape our future," says David Drillock, Cytec's vice president and Chief Financial Officer. "When the economy began to deteriorate in 2008, we decided to accelerate this effort."

Furthermore, to sustain the changes, Cytec would need better metrics and reporting capabilities. Importantly, it would need to change its culture, effectively embedding a focus on working capital into decision-making throughout the organization. "We want our people

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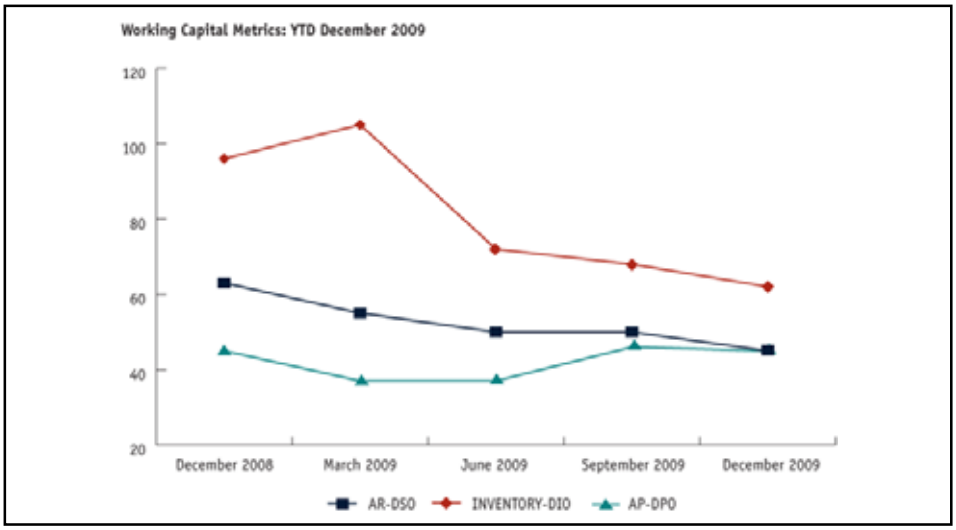
to understand how their day-to-day activities affect working capital," says Scott Hain, Vice President, Global Supply Chain, Cytec Specialty Chemicals. "Anytime an individual makes a decision, he or she should ask, 'What impact will this have on working capital?'"



Charting the Course for Improvement

To help the company formulate a plan for accelerating working capital improvements without negatively affecting customer service, Cytec sought assistance from REL. "Just about anyone can take steps to address working capital, but we wanted to make sure our results were sustainable," notes Drillock. "We wanted a partner who understands this and working capital is REL's business."

Partnering with the Cytec team, REL outlined a clear, detailed, practical path for analyzing and addressing several key functional areas that affect working capital, with project teams assigned to each area. Over a six-week period, team members examined a sample of Cytec's operating locations on two continents, conducted in-depth interviews with frontline personnel and analyzed transaction-level activities to identify potential drivers of increased working capital. A key component of REL's analysis involved a nine-box segmentation model, used to differentiate products, suppliers and customers according to key attributes. "The nine-box segmentation model was crucial to the success of this project," says Cytec Specialty Chemicals Controller Duncan Taylor. "It's a simple model, but it really changed the focus for us by providing the quantitative basis for segmentation."

Based on its analysis, REL estimated that Cytec could exceed its working capital improvement goal by:

- Standardizing collections processes across geographies and units, developing differentiated credit and collection policies based on customer characteristics and implementing an escalation process to avoid overdue receivables.
- Updating inventory parameters and creating a tool for making intelligent trade-offs between cost and service levels for different categories of products.
- Negotiating improved payment terms with key suppliers and implementing a payment clock to ensure bills were not paid before they were due.

Before the analysis, Cytec's management expected that the main working capital benefits would come from inventory reduction. In fact, the analysis showed that there were greater near-term improvements available in payables and receivables. These quick wins improved the overall cash flow of the project and help fund the longer-term inventory work stream.

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"We knew that we were on the right track," says Hain, "but the analysis provided the evidence and specificity that enabled us to refocus priorities across functions and gain support for moving forward." Together, REL and Cytec used the findings to create a comprehensive business case for process changes that helped obtain buy-in from senior leaders as well as operational teams.

Building a Cash Culture

Just a few months into the implementation process, Cytec executives observed their own people "talking" the new concepts and applying them with discipline in their day-to-day activities. "We were able to generate some quick wins, particularly in the payables and receivables area," says Hain. "Once people saw the successes, everyone wanted to be involved." Taylor credits the project with helping the company's culture evolve. "This project, for example, brought new exposure to the credit group and emphasized the importance of its role in facilitating collections rather than just managing credit risk. In the process, the group became," he comments.

Guided by REL's project management approach, which included frequent status reviews and strong coordination between multinational teams, Cytec initiated a five-month effort to implement the recommended process changes in its Specialty Chemicals business unit. Implementation in its Engineered Materials unit began several months later. Cytec teams participated actively in the process and in REL-led workshops, in effect becoming subject matter experts who now apply the tools and best practices to accelerate and sustain the benefits. "We were impressed with how REL explained the various concepts involved, with its emphasis on knowledge transfer, and with its collaborative, team-oriented approach," says Taylor. "REL involved Cytec in every aspect of the effort, rather than doing everything with Cytec personnel watching."

REL also helped Cytec define the operational metrics and key performance indicators that it is using to measure these processes going forward, using Cytec's data warehouse to produce reports that provide greater performance insight for the three key process areas addressed. "If you change the way you look at things, then those things will change," Drillock notes. "We had all of this information before, but we weren't able to get to it efficiently and present it in the right way."

Strong sponsorship and visible leadership support were instrumental in helping Cytec move quickly to address its goal. Leaders communicated its progress and successes widely and reorganized regular departmental and management meetings to focus on the metrics that drive working capital. In addition, the company adapted its incentive compensation structure at all levels to reward individuals for achieving company-wide working capital goals.

Surpassed Expectations, Sustainable Processes

Less than a year after it began incorporating REL's recommendations, Cytec surpassed its own working capital reduction goals through a combination of changes to its receivables, inventory management and payables processes. This has occurred even as the company continues to roll out the changes to other regions of the world. Within each process area, Cytec made significant progress against its key metrics. For example, it realized reductions in days inventory on hand, day's sales outstanding, and days to pay. Most importantly, by turning working capital into cash, Cytec remained focused on its future vision for growth and was able to continue investing in the businesses that are critical to that vision, even through a challenging economic environment. Simply put, the new management processes give the company a competitive edge.

Question

Write down the short note on the above case.

Source: http://www.thehackettgroup.com

Notes

Self Assessment

Fill in the blanks:

7. Ending balance = Beginning balance + …… – Disbursement
8. Determining the appropriate working balance in the face of non-synchronous but predictable cash flows is a problem of minimising ……
9. The current account balance that the firm should maintain is the compensating balance requirement or the……., whichever is greater.

6.4 Summary

- Steps to improve the efficiency of collection and disbursement must focus on the cash cycle of the firm. Concentration accounts can be used to reduce the requirement for working balances.
- Collection time can be reduced by the use of a lock-box system. Disbursements should be made within credit term but no sooner than required.
- A working cash balance is required for various business purposes so its adequacy is very important for the business.
- Determination of the optimal level of working cash balance is a *sine qua non* for efficient business operations. In some cases, bank compensating balance requirements may determine the minimum working balance. Where this is not the case, finding the optimal balance involves a trade-off between transaction costs (high for low working balances) and opportunity costs (high for high working balances).
- By combining the qualitative insights from theoretical models with techniques such as cash budgeting and proforma analysis most firms can arrive at reasonable answers with some experimentation.
- Firms hold liquid assets over and above working-balance requirements for two main reasons: as temporarily idle transaction balances to meet the transaction requirements and as precautionary balances. Vehicles for investing such cash reserves should be evaluated on the basis of default risk.
- Maturity, marketability and yields on such short-term money-market instruments vary over the business cycle and tend to average slightly less than those of longer-maturity issues.

6.5 Keywords

Default risk: Default risk refers to the possibility that interest or principal might not be paid on time and in the amount promised.

Managing working capital: Managing working capital means controlling the collection, disbursement, and investment of cash. When it comes to managing working capital, time is money.

Marketability: Marketability refers to the ease with which an asset can be converted into cash.

Maturity: Maturity refers to the time period over which interest and principal payments are to be made.

Notes

6.6 Review Questions

1. What are the advantages of concentration banking?
2. How can a firm speed the collection of cash?
3. Suppose a firm's cash inflows and outflows are variable but completely predictable. How are the concepts of inventory theory applicable to such a problem?
4. Suppose a firm's cash inflows and outflows are completely random. What approach might a firm use to set its minimum working balance?
5. Why might a firm have idle cash?
6. Discuss the criteria that a firm should use in choosing assets in which to invest idle cash.

Answers: Self Assessment

1.	True	2.	True
3.	True	4.	False
5.	True	6.	True
7.	Receipts	8.	Total costs
9.	Optimal working balance		

6.7 Further Readings

Books

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Online links

www-935.ibm.com/services/uk/bcs/pdf/working_capital_paper.pdf

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Notes

Unit 7: Cash Management

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the aspects of cash management
- Discuss the motives for holding cash and marketable securities
- Identify the factors determining optimum cash balance
- Explain the cash management models of Baumol, Miller-Orr, Stone and Beranek

Introduction

Cash is the lifeblood of a business firm; it is needed to acquire supplies, resources, equipment, and other assets used in generating the products and services provided by the firm. It is also needed to pay wages and salaries to workers and managers, taxes to governments, interest and principal to creditors, and dividends to shareholders. More fundamentally, cash is the medium of exchange, which allows management to carry on the various activities of the business firm from day to day. As long as the firm has the cash to meet these obligations, financial failure is improbable. Without cash, or at least access to it, bankruptcy becomes a grim possibility. Such is the emerging view of modern corporate cash management. On the other hand, marketable securities come in many forms and will be discussed later, but their main characteristic is that they represent "near cash" in that they may be readily sold. Hence marketable securities serve as a back up pool of liquidity that provides cash quickly when needed. Marketable security also provides a short-term investment outlet for excess cash and is also useful for meeting planned outflows of funds.

In the previous units we introduced the general concepts associated with managing the firm's current assets and liability positions. In this unit, we look in more detail at the problem involved with managing two very important components of current assets; cash and marketable securities.

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7.1 Aspects of Cash Management

Business analysts report that poor management is the main reason for business failure. Poor cash management is probably the most frequent stumbling block for entrepreneurs. Understanding the basic aspects of cash management will help you plan for the unforeseen eventualities that nearly every business faces.

Cash vs. Cash Flow

Cash is ready money in the bank or in the business. It is not inventory, it is not accounts receivable (what you are owed), and it is not property. These can potentially be converted to cash, but can't be used to pay suppliers, rent, or employees.

Notes Profit growth does not necessarily mean more cash on hand. Profit is the amount of money you expect to make over a given period of time, while cash is what you must have on hand to keep your business running. Over time, a company's profits are of little value if they are not accompanied by positive net cash flow. You can't spend profit; you can only spend cash.

Cash flow refers to the movement of cash into and out of a business. Watching the cash inflows and outflows is one of the most pressing management tasks for any business. The outflow of cash includes those checks you write each month to pay salaries, suppliers, and creditors. The inflow includes the cash you receive from customers, lenders, and investors.

Did u know? **What are positive and negative cash flows?**

1. ***Positive Cash Flow:*** If its cash inflow exceeds the outflow, a company has a positive cash flow. A positive cash flow is a good sign of financial health, but is by no means the only one.
2. ***Negative Cash Flow:*** If its cash outflow exceeds the inflow, a company has a negative cash flow. Reasons for negative cash flow include too much or obsolete inventory and poor collections on accounts receivable (what your customers owe you). If the company can't borrow additional cash at this point, it may be in serious trouble.

Components of Cash Flow

A "Cash Flow Statement" shows the sources and uses of cash and is typically divided into three components:

1. ***Operating Cash Flow:*** Operating cash flow, often referred to as working capital, is the cash flow generated from internal operations. It comes from sales of the product or service of your business, and because it is generated internally, it is under your control.
2. ***Investing Cash Flow:*** Investing cash flow is generated internally from non-operating activities. This includes investments in plant and equipment or other fixed assets, non-recurring gains or losses, or other sources and uses of cash outside of normal operations.
3. ***Financing Cash Flow:*** Financing cash flow is the cash to and from external sources, such as lenders, investors and shareholders. A new loan, the repayment of a loan, the issuance of stock, and the payment of dividend are some of the activities that would be included in this section of the cash flow statement.

Notes

Managing the Cash

Cash management has assumed importance because it is the most significant of all current assets. It is required to meet business obligations and it is unproductive when not used.

Cash management deals with the following:

1. Cash inflows and outflows
2. Cash flows within the firm
3. Cash balances held by the firm at a point of time.

Managing Cash Flows

After estimating the cash flows, efforts should be made to adhere to the estimates of receipts and payments of cash. Cash management will be successful only if cash collections are accelerated and cash disbursement, as far as possible, are delayed. The following methods of cash management will help:

Methods of Accelerating Cash Inflows

1. Prompt Payment by Customer.
2. Quick Conversion of Payment into Cash.
3. Decentralized Collection.
4. Lock Box System.

Methods of Slowing Cash Outflows

1. Paying on Last Date.
2. Payment through Drafts.
3. Adjusting Payroll Funds.
4. Centralization of Payments.
5. Interbank Transfer.
6. Making use of Float.

Self Assessment

Fill in the blanks:

1. As long as the firm has the ....., financial failure is improbable.
2. Business analysts report that poor ..... is the main reason for business failure.
3. Profit is the amount of money you ..... to make over a given period of time, while cash is what you ..... to keep your business running.

7.2 Motives for Holding Cash and Marketable Securities

Cash and short-term, interest-bearing investments, (marketable securities) are the firm's least productive assets. They are not required in producing goods or services, unlike the firm's fixed

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assets, they are not part of the process of selling as are inventory and accounts receivable. When firms hold cash in currency or in non-interest-bearing accounts, they obtain no direct return on their investment. Even if the cash is temporarily invested in marketable securities, its return is much less than the return on other assets held by the firm. So why hold cash or marketable securities at all? Couldn't the firm's resources be better deployed elsewhere?

Despite the seemingly low returns, there are several good reasons why firms hold cash and marketable securities. It is useful to think of the firm's portfolio of cash and marketable securities as comprised of three parts with each part addressing a particular reason for holding these assets.

1. ***Cash for Transactions:*** One very important reason for holding cash in the form of non-interest-bearing currency and deposits is transactions demand. Since debts are settled via the exchange of cash, the firm must hold some cash in the bank to pay suppliers and some currency to make change if it makes sales for cash.

2. ***Cash and Near-cash Assets as Hedges:*** Unfortunately, the firm's future cash needs for transactions purposes are often quite uncertain; emergencies may arise for which the firm needs immediate cash. The firm must hedge against the possibility of these unexpected needs. Several types of hedges are possible. For example, the firm can arrange to be able to borrow from its bank on short notice should funds suddenly be needed. Another approach is to hold extra cash and near-cash assets beyond what would be needed for transactions purposes. By "near-cash assets," we mean interest-earning marketable assets that have very short maturities (a few days or less), and thus can be liquidated to provide funds on short notice with very little risk of loss.

   Clearly, the more of this total hedging reserve held in near-cash assets and the less held in cash, the greater the interest earned. However, there is a trade-off between this interest revenue and the transactions costs involved in purchasing and selling such near-cash assets. These transactions costs have a fixed cost component; the firm bears these fixed costs when it buys or sells these assets regardless of the size of investment. Thus, whether it is economical to invest part or all of the hedging reserve in near-cash assets depends on the amount of the reserve. Firms that keep smaller reserves (because their transactions needs are either smaller or more certain) are more likely to hold these reserves in cash, while firms with larger reserves keep them in near-cash assets.

3. ***Temporary Investments:*** Many firms experience some seasonality in sales. Often, there will be times during the year when such firms have excess cash that will be needed later in the year. Firms in this situation have several choices. One alternative is to pay out the excess cash to its security holders when this cash is available, and then issue new securities, later in the year when funding is needed.

   Caution However, the costs of issuing new securities usually make this a disadvantageous strategy. More commonly, firms will temporarily invest the cash in interest-earning marketable securities from the time the cash is available until the time it is needed. Proper planning and investment selection for this strategy can yield a reasonable return on such temporary investment.

All of these are valid reasons for holding cash and marketable securities in response to the needs and uncertainties faced by the firm. In fact, firms generally hold a surprisingly large portion of their assets in these forms, despite the disadvantage of low returns.

Notes

Self Assessment

Fill in the blanks:

4. ..... refers to the movement of cash into and out of a business.
5. The inflow includes the cash you receive from ..... , ... and .....
6. If its cash ..... exceeds the ..... , a company has a positive cash flow.
7. A ..... shows the sources and uses of cash.

7.3 Factors Determining the Optimum Cash Balance

A firm has to maintain a minimum amount of cash for settling the dues in time. The cash is needed to purchase raw materials, creditors, day to day expenses, dividend, etc. The test of liquidity of the firm is that it is able to meet various obligations in time.

Some cash will be needed for transaction needs an amount may be kept as a safety stock. An appropriate amount of cash balance to be maintained should be determined on the basis of past experience and future expectations. If a firm maintains less cash balance then its liquidity position will be weak. If higher cash balance is maintained then an opportunity to earn is lost. Thus a firm should maintain an optimum cash balance, neither a small nor a large cash balance. For this purpose the transaction costs and risk of too small a balance should be matched with the opportunity costs of too large a balance.

The factors that determine the optimum cash balances are:

1. Synchronization of cash flows
2. Short costs
3. Excess cash balance
4. Procurement and management
5. Uncertainty.

1. ***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 payment of cash perfectly coincide with each other, there would be no need for cash balances. The first consideration in determining the cash balances is hence the extent of synchronization of cash receipts and disbursements. For this purpose, the inflows and outflows have to be forecast over a period of time depending upon the planning horizon which is typically a one year period with each of 12 months being a sub-period. The technique adopted is a cash period. A properly prepared budget will pinpoint the month/periods when the firm will have an excess or a shortage of cash.
2. ***Short Costs:*** The other most important factor in determining the optimum cash is the shortfall in cash needs. The cash forecast as presented in the cash budget would reveal cash shortage periods. Despite this, there may be some additional shortfall. 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.

Notes

Example: Transaction costs, Borrowing costs, Loss of cash discount, Cost associated with deterioration of credit rating, and Penalty rates.

3. ***Excess cash balance:*** If a affirm is having large funds lying as idle, it shows 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.

Caselet

Purple Software Solutions: Missed Opportunities

In Shahadara, Delhi, Mr Gulab Kohli starts a business in the name of Purple Software Solutions by the capital he inherited after his father sold his toy manufacturing business and died later in the year 1999. Since the money he invested initially was more than his business needed, Mr Gulab Kohli spent it in maintaining his office lavishly and when questioned about the same by his wife, he replied that it was all to attract customers. Obviously, he concentrated more on office maintenance that was required. Also he had this a habit of maintaining some 25 lac rupees in cash at home so that if and when required, he could spend it. ON his also, his wife questioned him once, to which he said that they may require cash anytime, and since he has a lot of it, there is no harm in keeping it safely at home.

Later on, when he needed funds for following up his prospective clients, he started falling short of cash. Reason is for anybody to guess. He spent the money on wrong heads. And sooner or later, the cash he kept at home had to deplete. As a result of this, he incurred huge losses and to close his business.

4. ***Procurement and management:*** Procurement and management costs are associated with establishing and operating cash management staff and activities. They are usually fixed and are mainly accounted for by salary, storage, handling of securities, etc.

5. ***Uncertainty:*** 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 collection and disbursements, defaults and unexpected cash needs.

Task Think of the conditions/situations when the impact of uncertainty on cash management can be mitigated and enlist such situation.

A firm has to maintain a minimum of cash for settling the dues in time. The cash is needed to purchase raw materials, Creditor's day to day expenses, dividend, etc. The test of liquidity of the firm is that it is to meet various obligations in time.

Some cash will be needed for transaction needs and amount may be kept as a safety stock. An appropriate amount of cash balance to be maintained should be determined on the basis of past experience and future expectations. If a firm maintains less cash balance then its liquidity position will be weak. If higher cash balance is maintained then an opportunity to earn is list. Thus a firm should maintain an optimum cash balance neither a small nor a large cash balance. For this purpose the transaction costs and risk of too small a balance should be matched with the opportunity costs of too large a balance.

Notes

Case Study

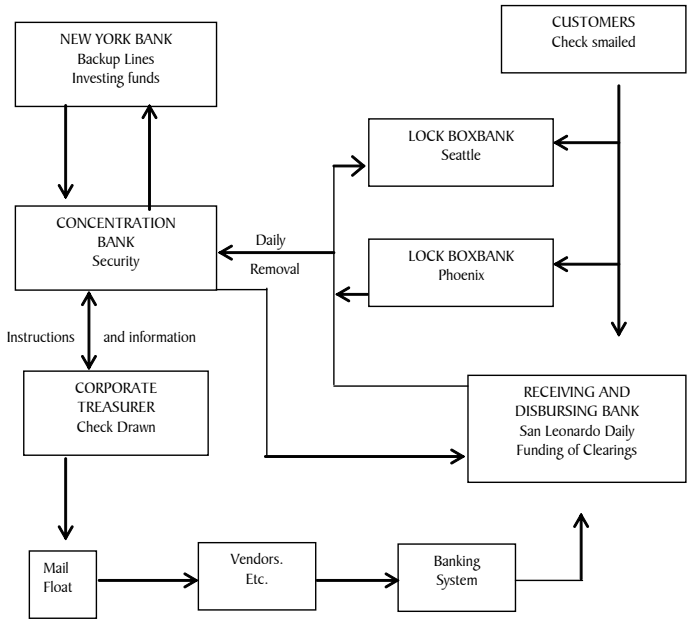
Bhatt Enterprises Case: Cash Forecasting and Investing

Sushma is the Treasurer of Bhatt Enterprises, a poorly organized collection of financial services companies. The composition of Bhatt's activities can best be seen in a statement of forecasted cash flow by each major business line, namely:

	Annual Cash Flow
Insurance policies	$ 85,000,000
Insurance underwriting	55,000,000
Assets based lending	200,000,000
Consumer paper	155,000,000
Auto dealer paper	80,000,000
	$ 575,000,000

Sushma has inherited a concentration banking system, as shown in Figure 1. After examining its features, he felt satisfied that it meets the needs of Bhatt Enterprises. The hometown bank in San Francisco. California is not a member of any clearinghouse; all cheques are processed through a correspondent relationship with security. The lockboxes in Phoenix and Seattle are efficiently managed by security and thus, average only one day float. This is the same as for funds deposited directly as security. Excess funds are wired daily to New Jersey for same day investment.

Figure 1: Bhatt Enterprises Concentration Banking System



Contd...

Notes

On September 8, Sushma is preparing his monthly report on funds invested during August. Table 1 shows the deposits each day during the month. It also shows the book disbursements: that is, checks written but not clearing each day. This information comes directly from the ledger accounts of Bhatt Enterprises.

Table 1: Daily Deposits and Cheques Drawn, Bhatt Enterprises

For the Month of August Starting Balance	Daily Deposit	Cheques Drawn	Books Balance
			3,20,000
1	2,150,000	1,740,000	7,30,000
2	1,340,000	1,765,000	3,05,000
3	0	0	3,05,000
4	0	0	3,05,000
5	2,330,000	1,292,000	1,343,000
6	1,475,000	1,628,000	1,191,000
7	2,567,000	1,555,000	1,202,000
8	2,300,000	1,432,000	3,070,000
9	1,278,000	1,606,000	2,742,000
10	0	0	2,742,000
11	0	0	2,742,000
12	2,879,000	1,666,000	3,955,000
13	2,075,000	2,925,000	3,105,000
14	1,444,000	2,450,000	2,099,000
15	2,316,000	2,650,000	1,765,000
16	978,000	1,605,000	1,138,000
17	0	0	1,138,000
18	0	0	1,138,000
19	3,015,000	1,777,000	2,376,000
20	1,866, 000	2,355,000	1,887,000
21	1,924,000	2,202,000	1,791,000
22	2,416,000	2,330,000	1,877, 000
23	1,555, 000	1,270, 000	1,162, 000
24	0	0	1,162, 000
25	0	0	1,162, 000
26	2,650, 000	1,348, 000	2,464, 000
27	1,145, 000	2,603, 000	1,006, 000
28	3,065, 000	2,588, 000	1,483, 000
29	2,205, 000	2,346, 000	1,342, 000
30	2,488, 000	1,758, 000	2,072, 000
31	0	0	2,072, 000

Contd...

Notes

Table 2: New Goods Funds Credited Daily, Bhatt Enterprises

For the Month of August Starting Balance	New Goods Funds	Cheques Cleared	Books Balance
			700.000
1	1,832,000	1,460,600	1,069,400
2	2,055,000	1,832,250	1,292,150
3	0	0	1,292,150
4	0	0	1,292,150
5	8,69,480	1,352,650	808,980
6	2,123,400	2,303,750	628,630
7	1,467,300	2,292,950	(197,020)
8	2,454,400	1,524,900	723,480
9	2,300,120	1,142,700	1,880,900
10	0	0	1,880,900
11	0	0	1,880,900
12	3,40,600	1,645,160	576,350
13	2,790,680	1,511,950	1,855,080
14	2,040,240	1,492,900	2,402,420
15	1,481,680	1,043,900	2,840,200
16	2,070,120	3,072,850	1,837,470
17	0	0	1,837,470
18	0	0	1,837,470
19	1,174,834	2,758,750	253,554
20	3,366,940	2,555,000	1,065,494
21	1,860,300	2,349,250	576,544
22	1,903,860	1,043,250	1,437,154
23	2,400,000	3,100,740	736,414
24	0	0	736,414
25	0	0	736,414
26	1,699,680	2,237,750	198,344
27	2,986,200	2,128,500	1,056,044
28	1,195,500	2,309,000	(57,456)
29	2,882,200	1,475,500	1,349,244
30	2,246,300	506,800	3,088,744
31	0	0	3,088,744
Total	44,917,294	41,385,850	

Separately, Table 2 shows the new good funds credits to Bhatt account each day in August. It also shows the cheques that cleared, as reported by the bank.

Contd...

Notes

Questions

1. Draw the monthly report giving the real picture about:
   (a) Total Cheques Written
   (b) Average Cash Balance
2. For how many days, the firm have negative cash balance and also mention the day of week, which has highest level of deposit and highest level of cheques written?

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books

Self Assessment

Fill in the blanks:

8. ..... is the cash flow generated from internal operations.
9. ..... is the cash to and from external sources.
10. After estimating the cash flows, efforts should be made to adhere to the estimates of ..... and ..... of cash.
11. When firms hold cash in currency or in non-interest-bearing accounts, they obtain no direct return on their .....

7.4 Approaches to Determine an Optimal Cash Balance

There are basically two approaches to determine an optimal cash balance namely,

1. Preparing cash budget
2. Minimizing cost models.

7.4.1 Cash Budget

Cash budget is the most important tool in cash management. A cash budget is an estimate of cash receipt and disbursements of cash during a future period of time. In the work of Soloman Ezra, a cash budget is an analysis of flow of cash in a business over a future, short or long period of time. It is a forecast of expected cash intake and outlay. It is a device to plan and control and use of cash. This cash budget pin points the period when there is likely to be excess or shortage of cash. Thus a firm by preparing a cash budget can plan the use of excess cash and make arrangements for the necessary cash as and when required.

The cash receipts from various sources are anticipated. The estimated cash collections for sales, debts, bill receivables, interests, dividends and other incomes and sale of investments and other assets will be taken into account. The amounts to be spent on purchase of materials, payment to creditors and meeting various other revenue and capital expenditure need should be considered. Cash forecasts will include all possible sources from which cash will be received and the channels in which payments are to be made so that a consolidated cash position is determined.

7.4.2 Models

Different analysts have developed and presented are different models to determine the optimum cash balance with a firm. Let us see a few of them.

Notes

The Baumol Model

The Baumol model of cash management is one of many by which cash is managed by companies. It is extensively used and highly useful for the purpose of cash management. The model enables companies to find out their desirable level of cash balance under certainty.

At present many companies make an effort to reduce the costs incurred by owning cash. They also strive to spend less money on changing marketable securities to cash. The Baumol model of cash management is useful in this regard.

Assumptions

There are certain assumptions or ideas that are critical with respect to the Baumol model of cash management:

1. The particular company should be able to change the securities that they own into cash, keeping the cost of transaction the same. Under normal circumstances, all such deals have variable costs and fixed costs.
2. The company is capable of predicting its cash necessities. They should be able to do this with a level of certainty. The company should also get a fixed amount of money. They should be getting this money at regular intervals.
3. The company is aware of the opportunity cost required for holding cash. It should stay the same for a considerable length of time.
4. The company should be making its cash payments at a consistent rate over a certain period of time. In other words, the rate of cash outflow should be regular.

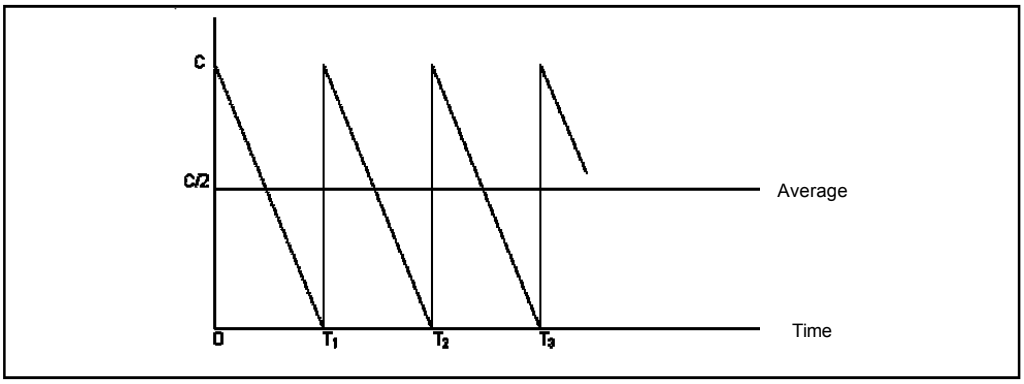
Equational Representations in Baumol Model of Cash Management

1. Holding Cost = k(C/2)
2. Total Cost = k(C/2) + c(T/C)
3. Transaction Cost = c(T/C)

Limitations

1. Cash flows may not be very predictable, much less constant
2. Treasurers may want a 'safety stock' of cash

For example, let us assume that the firm sells securities and starts with a cash balance of C rupees. When the firm spends cash, its cash balance starts decreasing and reaches zero. The firm again gets back its money by selling marketable securities. As the cash balance decreases gradually, the average cash balance will be: C/2. This can be shown in following figure:



Notes

The firm incurs a cost known as holding cost for maintaining the cash balance. It is known as opportunity cost, the return inevitable on the marketable securities. If the opportunity cost is k, then the firm's holding cost for maintaining an average cash balance is as follows:

Holding Cost = k (C/2)

Whenever the firm converts its marketable securities to cash, it incurs a cost known as transaction cost. Total number of transactions in a particular year will be total funds required (T), divided by the cash balance (C) i.e. T/C. The assumption here is that the cost per transaction is constant. If the cost per transaction is c, then the total transaction cost will be:

Transaction Cost = c (T/C)

The total annual cost of the demand for cash will be:

$$\text{Total Cost} = k\,(C/2) + c\,(T/C)$$

Optimum Level of Cash Balance

As the demand for cash, 'C' increases, the holding cost will also increase and the transaction cost will reduce because of a decline in the number of transactions. Hence, it can be said that there is a relationship between the holding cost and the transaction cost.

The optimum cash balance, C* is obtained when the total cost is minimum.

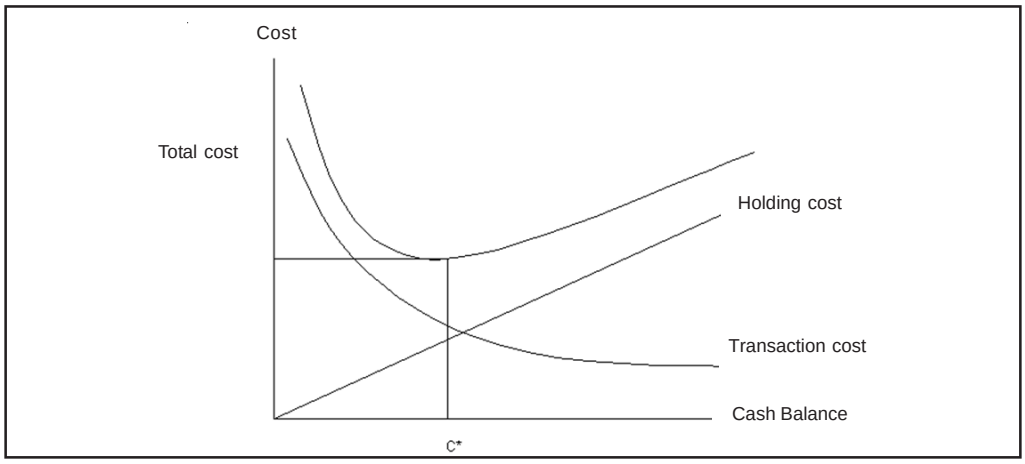
$$\text{Optimum cash balance } (C^*) = [2cT/k]^{1/2}$$

Where, C* is the optimum cash balance.

T is the total cash needed during the year.

k is the opportunity cost of holding cash balances.

With the increase in the cost per transaction and total funds required, the optimum cash balance will increase. However, with an increase in the opportunity cost, it will decrease.



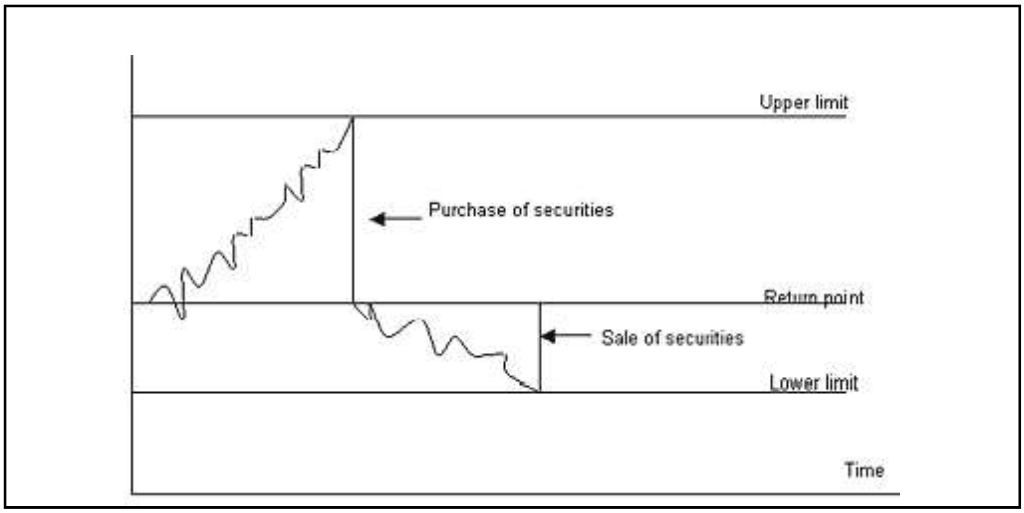
Miller-Orr Model

Most firms don't use their cash flows uniformly and also cannot predict their daily cash inflows and outflows. Miller-Orr Model helps them by allowing daily cash flow variation.

Under the model, the firm allows the cash balance to fluctuate between the upper control limit and the lower control limit, making a purchase and sale of marketable securities only when one

Notes

of these limits is reached. The assumption made here is that the net cash flows are normally distributed with a zero value of mean and a standard deviation. This model provides two control limits – the upper control limit and the lower control limit as well as a return point. When the firm's cash limit fluctuates at random and touches the upper limit, the firm buys sufficient marketable securities to come back to a normal level of cash balance i.e. the return point. Similarly, when the firm's cash flows wander and touch the lower limit, it sells sufficient marketable securities to bring the cash balance back to the normal level i.e. the return point.



The lower limit is set by the firm based on its desired minimum "safety stock" of cash in hand The firm should also determine the following factors:

1. An interest rate for marketable securities, (i)
2. A fixed transaction cost for buying and selling marketable securities, (c)
3. The standard deviation if its daily cash flows, (s)

The upper control limits and return path are than calculated by the Miller-Orr Model as follows:

Distance between the upper limit and lower limit is 3Z.

(Upper limit – Lower limit) = (3/4 C Transaction Cost C Cash Flow Variance/Interest Rate)$^{1/3}$

$$Z = (3/4 \text{ C cs2/i})^{1/3}$$

If the transaction cost is higher or cash flows shows greater fluctuations, than the upper limit and lower limit will be far off from each other. As the interest rate increases, the limits will come closer. There is an inverse relation between the Z and the interest rate. The upper control limit is three times above the lower control limits and the return point lies between the upper and lower limits. Hence,

$$\text{Upper Limit} = \text{Lower Limit} + 3Z$$

$$\text{Return Point} = \text{Lower Limit} + Z$$

So, the firm holds the average cash balance equal to:

$$\text{Average Cash Balance} = \text{Lower Limit} + 4/3\ Z$$

The Miller-Orr Model is more realistic as it allows variation in cash balance within the lower and upper limits. The lower limit can be set according to the firm's liquidity requirement. To

Notes

determine the standard deviation of net cash flows the pasty data of the net cash flow behaviour can be used. Managerial attention is needed only if the cash balance deviates from the limits.

Stone Model

The Stone Model is somewhat similar to the Miller-Orr Model insofar as it uses control limits. It incorporates, however, a look-ahead forecast of cash flows when an upper or lower limit is hit to take into account the possibility that the surplus or deficit of cash may naturally correct itself. If the upper control limit is reached, but is to be followed by cash outflow days that would bring the cash balance down to an acceptable level, then nothing is done. If instead the surplus cash would substantially remain that way, then cash is withdrawn to get the cash balance to a predetermined return point. Of course, if cash were in short supply and the lower control limit was reached, the opposite would apply. In this way the Stone Model takes into consideration the cash flow forecast.

Beranek Model

According to Beranek, companies have short-term assets only because they face uncertainties related to their operations.

Example: A firm could incur substantial costs if the labor force of a vendor supplying a critical part suddenly went on strike. An inventory of the critical part enables the firm to continue operating while it seeks an alternate supplier or waits out the strike.

Similarly, a firm may hold a cash reserve to meet unanticipated demand for cash. Since cash is an unproductive asset, cash reserves are often held in the form of highly liquid short-term investments.

A = A(ω) the cash out flow depends on the uncertain event w which makes A(w) a stochastic variable.

$$W_1(W_0, \omega) = W_0 - A(\omega)$$

Beranek assumes there is a critical cash balance W* which triggers increased cost borrowing r + Δ. In t = 0 we have cash of W_0 in t = 1 ω is observed and A(ω) is paid from W_0 (possibly under acceptance of penalty interest Δ). Keep in mind, that W_0 here denotes the cash level that we initially establish in t = 0 with only one cash outflow A(ω) occurring. Where as in Baumol's model W_0 denotes the amount that is withdrawn m times.

The return of the policy W_0 is as follows:

$$\tilde{h}(W_0,\omega) = (K - W_0)r - \begin{cases} (r+\Delta)\left(W^* - W_1(W_0,\omega) \text{ for } W_1 < W^*\right) \\ 0 \text{ otherwise} \end{cases}$$

$$= (K - W_0)r - \begin{cases} (r+\Delta)\left(W^* - W_0 + A(\omega) \text{ for } A(\omega) \geq W_0 - W^*\right) \\ 0 \text{ otherwise} \end{cases}$$

Objective function: $\max_{W_0} E(h(W_0,\omega))$

$$E(h(W_0,\omega)) = (K - W_0)r - \int_{W_0 - W^*}^{\infty} (W^* - W_0 + A)(r+\Delta)dF(A)$$

Notes

with F(A) as the distribution function of A(ω)

$$\frac{\partial E(h)}{\partial W_0} = -r - (r+\Delta)\left[\frac{\partial}{\partial W_0}\int_{W_0 - W^*}^{\infty}\left(W^* - W_0 + A\right)dF(A)\right]$$

To evaluate the expression above we use Leibnitz:

$$\frac{d}{da}\int_{u(\alpha)}^{v(\alpha)} g(\alpha,x)dx = \int_{u(\alpha)}^{v(\alpha)}\frac{\partial}{\partial\alpha}g(\alpha,x)dx + \frac{\partial v(\alpha)}{\partial\alpha}g(\alpha,v(\alpha)) - \frac{\partial u(\alpha)}{\partial\alpha}g(\alpha,u(\alpha))$$

with u, v and g continous differentiable functions

$$= -r - (r+\Delta)\left[\int_{W_0 - W^*}^{\infty}(-1)dF(A) + 0 - 1\left(W^* - W_0 + W_0 - W^*\right)\right]$$

$$= -r - (r+\Delta)(-1)\left(1 - F\left(W_0 - W^*\right)\right) = 0$$

$$= \frac{r}{r+\Delta} = 1 - F\left(W_0 - W^*\right)$$

$$= \frac{\Delta}{r+\Delta} = \frac{1}{1+\frac{r}{\Delta}} = F\left(W_0 - W^*\right) \text{ then } F^{-1}\left(\frac{1}{1+\frac{r}{\Delta}}\right) = W_0 - W^* \text{ or } F^{-1}\left(\frac{1}{1+\frac{r}{\Delta}}\right) = W_0 - W^*$$

$$W_0^* = W^* + F^{-1}\left(\frac{1}{1+\frac{r}{\Delta}}\right)$$

That means the optimal level of cash is the critical level W* plus a risk mark up

$$RM \equiv F^{-1}\left(\frac{1}{1+\frac{r}{\Delta}}\right)$$

$$\frac{\partial RM}{\partial r} < 0 \qquad \frac{\partial RM}{\partial \Delta} > 0 \qquad \frac{\partial W_0^*}{\partial r} < 0 \qquad \frac{\partial W_0^*}{\partial RM} > 0$$

How does a distribution function that tends to result in higher A(ω) affect RM.

$$\underbrace{prob_F\left(A \le A_0\right)}_{F(A_0)} \ge \underbrace{prob_G\left(A \le A_0\right)}_{G(A_0)} \Rightarrow 1 - prob_F\left(A \le A_0\right) \le 1 - prob_G\left(A \le A_0\right)$$

$$\Rightarrow prob_F\left(A \ge A_0\right) \le prob_G\left(A \ge A_0\right)$$

The probability to pay out A_0 with G is at least as high as with F.

Intuitively we say, with G we hold at least as much cash as F.

This means G is stochastic dominant to F:

$\Leftrightarrow G(A) \le F(A)\ \forall A \Rightarrow G^{-1} \ge F^{-1} \Rightarrow G$ has greater RM and $W_{0,G}^* \ge W_{0,F}^*$

Limitations

1. The model is static
2. The model usually does not reflect economic realities

The goals of these models are to ensure adequate amounts of cash on hand for bill payments, to minimize transaction costs in acquiring cash when deficiencies exist, and to dispose of cash

when a surplus arises. These models assume some cash flow pattern as a given, leaving the task of cash collection, concentration, and disbursement to other methods.

Self Assessment

Fill in the blanks:

12. A ..... is an estimate of cash receipt and disbursements of cash during a future period of time.
13. A firm has to maintain a ..... of cash for settling the dues in time.
14. The test of ..... of the firm is that it is able to meet various obligations in time.
15. ..... Model provides two control limits and a return point.

7.5 Summary

- Cash is the lifeblood of a business firm.
- It is needed to acquire supplies, resources, equipment, and other assets used in generating the products and services provided by the firm.
- It is also needed to pay wages and salaries to workers and managers, taxes to governments, interest and principal to creditors, and dividends to shareholders.
- More fundamentally, cash is the medium of exchange, which allows management to carry on the various activities of the business firm from day to day.
- As long as the firm has the cash to meet these obligations, financial failure is improbable. Without cash, or at least access to it, bankruptcy becomes a grim possibility. Such is the emerging view of modern corporate cash management.
- A firm has to maintain a minimum amount of cash for settling the dues in time.
- The cash is needed to purchase raw materials, a creditors, day to day expenses, dividend, etc.
- The test of liquidity of the firm is that it is able to meet various obligations in time.
- There are various models to determine the optimum cash balance with a firm.
- The goals of these models are to ensure adequate amounts of cash on hand for bill payments, to minimize transaction costs in acquiring cash when deficiencies exist, and to dispose of cash when a surplus arises.

7.6 Keywords

Current Ratio: A liquidity measure defined as current assets divided by current liabilities.

EPS: Earning Per Share.

Financial Risk: The risk which arises from the use of debt capital.

Investing Cash Flow: Investing cash flow is generated internally from non-operating activities. This includes investments in plant and equipment or other fixed assets, nonrecurring gains or losses, or other sources and uses of cash outside of normal operations.

Operating Cash Flow: Operating cash flow, often referred to as working capital, is the cash flow generated from internal operations. It comes from sales of the product or service of your business, and because it is generated internally, it is under your control.

Notes

7.7 Review Questions

1. In your opinion, what are the motives that a company may have for holding liquid assets? Explain the costs and benefits associated with holding liquid assets.
2. "It is normal for the financial manager to place great importance on the cash budget in determining the desirable cash holdings for a company." How did Beranek utilise this approach to develop a model suitable for determining the company's optimal cash balance?
3. What action can a financial manager take to reduce a company's cash requirements?
4. "Liquidity risk is of greater importance than return risk in making decision about investments in short-term securities." Discuss.
5. What role do marketable securities play in fulfilling the firms' overall objective of maximising its owner's wealth? How does the presence of marketable securities in the firm's asset structure affect the risk associated with the firm?
6. If a firm reduces the average age of its inventories, what effect might this action have on the cash cycle and on the firm's total sales?
7. How would you test the liquidity of the firm? What would be the main criterion for that?
8. Elucidate upon the Beranek Model only by the help of examples.
9. In your opinion, what seems to be the reason behind the Baumol model being the most popular model of cash management?
10. Examine the factors that determine the optimum cash balances in a firm.

Answers: Self Assessment

1.	cash	2.	management
3.	expect, must have on hand	4.	Cash flow
5.	customers, lenders, investors	6.	inflow, outflow
7.	"Cash Flow Statement"	8.	Operating cash flow
9.	Financing cash flow	10.	receipts, payments
11.	investment	12.	cash budget
13.	minimum	14.	liquidity
15.	Miller-Orr		

7.8 Further Readings

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Notes

Unit 8: Cash Planning

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the concept of cash planning
- Discuss the cash budget simulation
- Identify the cash balance uncertainties
- Discuss the hedging vs interest rate
- Describe the future and options

Introduction

Cash flow planning refers to the process of identifying the major expenditures in future (both short-term and long-term) and making planned investments so that the required amount is accumulated within the required time frame.

Cash flow planning is the first thing that should be done prior to starting an investment exercise, because only then will a firm be in a position to know how its finances look like, and what is it that it can invest without causing a strain on the working capital. It will also enable the firm to understand if a particular investment matches with its flow requirement.

The cash forecast is an estimation of the flows in and out of the firm's cash account over a particular period of time, usually a quarter, month, week, or day. The cash forecast is primarily intended to produce a very useful piece of information: an estimation of the firm's borrowing and lending needs and the uncertainties regarding these needs during various future periods.

Cash forecasting is extremely important to most firms. It enables them to anticipate periods of surplus cash and periods where financing will be necessary. This anticipation is the reason that cash forecasts are generated. Anticipation enables the firm to plan much more effectively for investment and financing, and via this planning, produce superior return.

Notes

8.1 Objectives of Cash Planning

Cash planning has three main objectives:

1. To ensure that expenditures are smoothly financed during the year, so as to minimize borrowing costs;
2. To enable the initial budget policy targets, especially the surplus or deficit, to be met; and
3. To contribute to the smooth implementation of the policy as laid by the management.

An effective cash planning and management system should:

1. Recognize the time value and the opportunity cost of cash;
2. Enable line ministries to plan expenditure effectively;
3. Be forward-looking – anticipating macroeconomic developments while accommodating significant economic changes and minimizing the adverse effects on budget execution;
4. Be responsive to the cash needs of various departments;
5. Be comprehensive, covering all inflows of cash resources; and
6. Plan for the liquidation of both short- and long-term cash liabilities.

Even if a budget is realistic in the sense of having well-prepared and objective aggregate revenue and expenditure estimates, this does not mean that budget execution will be smooth. Timing problems can be expected between payments coming due and the availability of the cash necessary to discharge them.

Ideally, a cash plan for a centralized organization should include, for the month ahead, a daily forecast of cash outflows and cash inflows.

Fast growing organisations should aim to deliver their budget by adopting a monthly cash plan, based on projected aggregate cash inflows and limits on cash outflows. The principal components should be as follows:

1. The starting point should be an annual cash plan, prepared in advance of the fiscal year, setting out projected cash inflows and cash outflows month by month.
2. Past patterns can help establish likely month-to-month inflows of revenue receipts. The likely timing of borrowing is also often partly known in advance, so that total inflows can be projected. Past patterns of expenditures can usually be a guide to the cash outflows each month.
3. However, factors such as irregular capital expenditure patterns, variations in the timing of cash receipts and the precise timing of new borrowing (which may have to await a conjunction of beneficial market conditions) are likely to mean variation from year to year in monthly patterns of cash inflows and outflows.
4. When it appears from the initial projections that there might not be enough cash available within a given month to cover expenditures falling due, a firm can delay the planned commitment of the expenditure; speed up the collection of revenue; or borrow. The choice among the three options will depend on feasibility and costs.

Once the annual plan is established, it should become the basis for rolling three-month projections, and within that projection an operational cash management plans for the month ahead. These should operate as follows:

1. The three-month projections and monthly plans need to be revised each month on a rolling basis in the light of actual revenues and expenditures (and often experience in borrowing).

Notes

2. When the three-month rolling projections indicate there may not be enough cash available within one or more of the three forward months to cover expenditures, action can be taken to delay expenditure commitments, accelerate revenue collection, or borrow, with the choice depending on feasibility, costs, and borrowing constraints.

3. The operational cash management plan for the firm, for the month ahead, should ideally, include a daily (or at least weekly) forecast of cash outflows and inflows. This cash management plan should be prepared and updated at least every week.

Notes The operational monthly cash management plan is often translated into a monthly cash limit set on some, or all, expenditures of individual departments.

Some organisations have put limits on certain sub aggregates. These cash limits are often seen as being the way in which a "hard" budget constraint operates. But, as noted, as a means of expenditure rather than cash control, cash plans on their own are ineffective when there is no separate control over commitments, and often lead to a buildup of (unpaid) liabilities.

The cash plan assists in determining the realism of fiscal criteria or benchmarks for each month/quarter. It can engender a sense of confidence among the authorities that they have cash control and give them greater confidence that other important monetary targets (e.g., credit ceilings) will be respected. Thus, to be viable, the targets included in an adjustment program should always be supported by a cash plan that is updated to take into account the latest available information on revenues collected, other receipts (including borrowing), and expenditure committed and paid.

The continuous monthly updating of the cash plan should help in ensuring that the initial budget targets will be met. When it is clear from the latest forecast available that targets may not be met in the future or at the end of the year, measures will have to be taken to constrain expenditure or to increase revenues. The cash plan can contribute to the decisions on the size, type, and targeting of the measures required.

Caselet

Coming Out of Financial Pressures

Arjun Rathore was a self employed professional in Jodhpur. While he had only started a business of ethnic shoes, the government declared the new policy as a result of which, the credit would get squeezed. It went very harsh on Rathore, given the lack of a properly maintained accounting system, due to which he was now to face difficulty in borrowing from banks.

This resulted in Rathore's seeking the support of unregulated lenders, who were charging higher interests that would eventually squeeze Rathore's profit margins. The only way out was to manage the credit cycle and make proper cash planning.

Rathore met a chartered accountant named Holas Badheja who suggested him to aim at reducing the credit period given to the buyer by raising the bill immediately upon delivery and follow up meticulously till the payment was received. He suggested Rathore to also attempt to collect some margin money upfront. Another way to cut borrowing cost was awarding customers for prompt payment by giving competitive rates. This would also help gain repeat orders.

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Notes

These and many other similar resulting measures of cash planning not only made the future path of Rathore's business easy, but also made him withstand the financial pressures and sail out of them safely.

Source: hitchstoriesofsmallbusinesses.co.in

Task On the basis of the above discussion analyse and discuss why cash flow is planning important.

Self Assessment

State whether the following statements are true or false:

1. The cash planning is an estimation of the flows in and out of the firm's cash account over a particular period of time, usually a quarter, month, week, or day.
2. Cash forecasting enables them to anticipate periods of surplus cash and periods where financing will be necessary.
3. A cash plan for a centralized organization should include, for the month ahead, a daily forecast of cash outflows and cash inflows.

8.2 Cash Budget Simulation

A cash budget is important for a variety of reasons. For one, it allows you to make management decisions regarding your cash position (or cash reserve). Without the type of monitoring imposed by the budgeting process, you may be unaware of the cycle of cash through your business. At the end of a year or a business cycle, a series of monthly cash budgets will show you just how much cash is coming into your company and the way it is being used. Seasonal fluctuations will be made clear.

A cash budget also allows you to evaluate and plan for your capital needs. The cash budget will help you assess whether there are periods during your operations cycle when you might need short-term borrowing. It will also help you assess any long-term borrowing needs. Basically, a cash budget is a planning tool for management decisions.

Caution When preparing your cash budget, you remember

1. To make the ending cash balance the beginning cash balance for the next period
2. To factor any additional material, labor or other expenses for projected sales
3. To keep your sales goal for the period realistic
4. To adjust accounts receivable for possible uncollectible amounts
5. To include taxes in expenditures for payroll

There are three main components necessary for creating a cash budget. They are:

1. Time period
2. Desired cash position
3. Estimated sales and expenses

Notes

1. ***Time Period:*** The first decision to make when simulating a cash budget is to decide the period of time for which your budget has to apply. That is, are you simulating a budget for the next three months, six months, twelve months or some other period? In this chapter, we will be discussing the simulation of a 3-months budget. However, the instructions given are applicable to any time period you might select.

2. ***Cash Position:*** The amount of cash you wish to keep on hand will depend on the nature of your business, the predictability of accounts receivable and the probability of fast-happening opportunities (or unfortunate occurrences) that may require you to have a significant reserve of cash.

   You may want to consider your cash reserve in terms of a certain number of days' sales. Your budgeting process will help you to determine if, at the end of the period, you have an adequate cash reserve.

3. ***Estimated Sales and Expenses:*** The fundamental concept of a cash budget is estimating all future cash receipts and cash expenditures that will take place during the time period. The most important estimate you will make, however, is an estimate of sales. Once this is decided, the rest of the cash budget can fall into place.

Example: If an increase in sales of 10 percent is desired and expected, various other accounts must be adjusted in your budget. Raw materials, inventory and the costs of goods sold must be revised to reflect the increase in sales. In addition, you must ask yourself if any additions need to be made to selling or general and administrative expenses, or can the increased sales be handled by current excess capacity? Also, how will the increase in sales affect payroll and overtime expenditures?

Instead of increasing every expense item by 10 percent, serious consideration needs to be given to certain economies of scale that might develop. In other words, perhaps, a supplier offers a discount if you increase the quantities in which you buy a certain item or, perhaps, the increase in sales can be easily accommodated by the current sales force, all of these types of considerations must be taken into account before you start budgeting. Each type of expense (as shown on your income statement) must be evaluated for its potential to increase or decrease. Your estimates should be based on our experience running your business and on your goals for your business over the time frame for which the budget is being created.

At a minimum, the following categories of expected cash receipts and expected cash payments should be considered:

Cash Balance

1. ***Expected cash receipts:*** The cash balance is your cash on hand. This includes what is in your checking accounts, savings accounts, petty cash and any other cash accounts that you might have.

2. ***Cash sales:*** After arriving at a base figure of cash sales, it must be adjusted for any trade or other discounts and for possible returns. As stated previously, the base level of sales (and of accounts receivable) will be determined by the company's projections, goals and past experience.

Notes

3. ***Collections of accounts receivable:*** After a base level of accounts receivable is established (based on sales projections), it must be adjusted to reflect the amount that will actually be paid during the time period. Typical adjustments for a small business might be to assume that 90 percent of accounts receivable will be collected in the quarter in which the sales occur, 9 percent will be collected in the following quarter, and 1 percent will remain uncollectible. Of course, past experience will be the most reliable indicator for making these adjustments.

4. ***Other income:*** Your cash position may be affected positively by income other than that received from sales. Perhaps there are investments, dividends, or an expected borrowing that will be introducing cash to the company during the time period. These types of cash sources are referred to as "other income."

Expected Cash Expenses

1. ***Raw material (inventory):*** For small business retailers and manufacturers, the largest cash expense is usually the amount spent for inventory or raw materials. Again, past experience will be your best indicator of future cash outlays. But don't forget to factor in any necessary increases to keep up with projected sales. You may also want to consult with your suppliers as to whether any pricing changes are expected.

2. ***Payroll:*** Salaries are commonly the second largest expense item during an accounting period. Don't forget to include estimates for all appropriate local, state, and federal taxes.

Other Direct Expenses

Use this line item for any additional expense that does not fit conveniently under the other headings. If you are making payments on a loan, include it here.

1. ***Advertising:*** The role of advertising varies by type of business. If you are projecting an increase in sales, is there an accompanying marketing or advertising campaign? These costs must be budgeted. Include any expenses for print (brochures, mailers, and newspaper ads), radio, or other advertising services.

2. ***Selling expenses:*** Typical selling expenses include salaries and commissions for sales personnel and sales office expenses. However, this line item can also include any traveling or other sales-related expense not covered elsewhere.

3. ***Administrative expense:*** General office expenses are included here. This will include your utilities, telephone, copying and day-to-day office expenses. Unless big changes are underway, past experience will guide you in evaluating future administrative expenses.

4. ***Plant and equipment expenditures:*** Cash payments for equipment loans, mortgages, repairs, or other upkeep should be included here. Past experience will, again, be your guide.

5. ***Other payments:*** If there are any cash payments you expect to make that are not covered in the above listing, include them here. (If they are repeatable, you may consider adding a separate line item.) However, typically, interest payments and taxes fall here.

Notes

Example: Here is an example of a cash budget simulated for a small business:

Small Business Cash Budget
For the three months ending March 31, 200x

Item	Jan.	Feb.	March
Beginning cash balance	15,000	-13,500	20,000
Expected Cash Receipts:			
Cash Sales	20,000	25,000	30,000
Collection of accounts receivable	45,000	55,000	70,000
Other income	0	0	5,000
Total cash collected	80,000	66,500	125,000
Expected cash payments:			
Raw materials (or inventory)	50,000	11,000	5,000
Payroll	10,400	10,400	10,400
Other direct expenses	2,000	2,000	2,000
Advertising	10,000	0	0
Selling expenses	6,000	8,000	6,000
Administrative expenses	4,500	4,500	4,500
Plant and equipment expenditures	10,000	10,000	10,000
Other payments	600	600	600
Total cash expenses	93,500	46,500	38,500
Cash surplus (or deficit)	-13,500*	20,000*	86,500

* The ending cash balance becomes the beginning cash balance for the next period.

Case Study

Creative Promotion Company

Mr. Bhatt is a young man of bright ideas. Although he is employed as an engineer in one of the large engineering concerns in Lahore (Pakistan), he spends all his spare time developing new products in his private laboratory at home. Currently, he has commercially provided a domestic appliance called Lavex, which would be a great convenience kitchen to help housewives. He is not interest in manufacturing and selling his new products; his only interest in developing new products is to make money by way of selling patent rights to some established concerns. However, he releases that till he succeeds in selling the patent rights at the price he expects, he has to manufacture and sell the new products on ad hoc basis so as to demonstrate the commercial superiority of his products and thereby, to induce the parties to buy the patents from him. With this objective, he is currently thinking of manufacturing and selling 'Lavex'. He will not give up his full-time job; he will supervise and guide 'Lavex' production and sales during his spare time.

Bhatt has already spent ₹ 30,000 in developing the product. He proposes to buy the component from other parties and keep the production activity to a minimum. The minimum equipment

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Notes

required would cost ₹ 11,000. He would need to rent a small place for ₹ 1,200 per month for production. He proposes to use his residence as office for sales activity.

Bhatt proposes to introduce the product in Chennai city only. His sales projections are as follows:

January	60
February	40
March	110
April	140
May	220
June	180

He is not interested in pushing sales beyond 220 units per month as he cannot cope with the production. He has budgeted ₹ 20,000 for sales promotion, which will be spent mostly for demonstration in leading department stores in the city. The promotion budget is scheduled as follows:

	₹
January	7,000
February	7,000
March	3,000
April	3,000

This selling price per units will be ₹ 280 and the dealers will be given 15 percent trade discount. He calculates that about 50 unit will be needed for "demonstration and display" in the leading sores at his cost. Although the sales to dealers will be made on one month's credit, he knows that the actual collections will be realized in about 4 week's time. He rules out cash sales.

Assembling is one of the activities in the production process. Components and materials, which will be purchased from outside parties strictly on 30 days credit, will cost ₹ 160 per unit. Wages per month will be ₹6000. The production capacity per month will be 220 units. Wages will be paid weekly. Overhead expenses are estimated at ₹ 2800 per month. Materials and components need to be ordered at least one month in advance. There will be inventory of finished goods or goods in process as the production will be strictly against firm orders. Bhatt proposes to employ a full-time production, sales supervisor for ₹ 880 per month.

Mr Bhatt wants to know how much finance will be needed for his first six months of operation and when, so that he may plan accordingly.

Questions

1. Discuss the nature of the financial problem involved.
2. Prepare the monthly cash budget for the first six months period of the proposed venture.
3. How can the above-mentioned problem be sorted out?

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books

Notes

Self Assessment

Fill in the blanks:

4. ..... is an estimation of the flows in and out of the firm's cash account over a particular period of time.
5. Cash forecasting enables a firm to anticipate periods of ..... cash and ..... where financing will be necessary.
6. ..... uncertainty is the uncertainty regarding the firm's actual future collection patterns of receivables.

8.3 Cash Balance Uncertainties

Given the short-run nature of the cash forecast, with most things occurring in the near future and the forecast period typically being a year, one would tend to think that most financial transaction, over this period could be forecast very accurately. Unfortunately, this is far from true. Even with this short period there are numerous sources of risk. Among the sources are sales uncertainty; collection rate uncertainty, production cost uncertainty, and capital outflow uncertainty. Let us look at each one of these in turn.

Sales uncertainty refers to the risk regarding the firm's future levels of sales. Most firms try to forecast accurately enough to hold errors in short-run sales forecasts to less than 10 percent, but are often unsuccessful in these efforts. Sales-projections are a product of two other projections, units to be sold and price per unit. Both are often quite uncertain and depend on economic and competitive conditions. Note that any errors in sales forecasts have multiple impacts on the firm's cash flows; they impact on receivable levels (and therefore collections) and also on production expenses (and therefore disbursements).

Collection rate uncertainty is the uncertainty regarding the firm's actual future collection patterns of receivables. The firm may historically have collected an average of a certain percent of its outstanding receivables from a particular period in another particular period, but this average contains considerable variability. Further, changing market and economic conditions may make for chancy extrapolation of post historic data into future period. Because of this and the uncertainties in forecasting sales, forecasts of the collection of future receivables contain at least three sources of uncertainty; uncertainly regarding the number of units that will be sold, uncertainty regarding the price at which these units will be sold, and uncertainty regarding the patterns with which the receivables generated by these sales will be collected.

Production cost uncertainty has to do with the risk of the actual labour and material costs that go into the making of a product of service. Labour productivity may be more or less than expected, making labour costs uncertain. The cost of materials used may vary due to unexpected changes in price or in the amount of materials necessary to produce products and services.

Capital outflow uncertainty is one of the biggest sources of surprises in cash flow forecasting. This is the uncertainty regarding the timing of cash disbursements related to the firm's major capital expenditure and construction programmes. The uncertainty arises from the nature of payments made for new construction. When the firm undertakes to build a new plant or other project of this sort. The total price (subject to specified revisions) is generally agreed upon in advance. The construction firm then starts the project. After a certain percent of the project is done, the construction firm submits a "progress report" to the firm and is paid for what has been completed, less a retainage.

Example: Assume that the firm has contracted to have built a ₹ 10 crore building with a 10 percent retainage. Once the construction firm completes the first 20 percent of the project, a payment of ₹1.8 crore will be due (₹ 10 crore times 20 percent times 90 percent).

Notes

Such payments are subject to at least two uncertainties. First, the weather, a very risky variable, plays a significant part in the rate of construction completion. Second construction firms are notorious for filing late progress reports and then expecting immediate payment. While only a small percent of the firm's total bills are from capital construction programmes, the amounts involved are usually very large. One unexpected item of this sort can destroy a carefully planned cash flow management strategy.

Estimating Uncertainty in Cash Forecasts

There are two basic approaches to the assessment of risk in cash forecasting. First, we could assess the effects of individual sources of uncertainty on important individual outcome variables. Second, we could assess the effect of all the uncertainties in all the risky estimated variables on all the important outcome variables with all the uncertainties allowed to vary simultaneously Both of these methodologies are very useful. The first requires sensitivity analysis; the second requires simulation.

Sensitivity Analysis of the Cash Forecast

We know that there are uncertainties in the estimation of sales, collection rates, production and other cost amounts, and the timing and amount of capital disbursements, at the least. Using sensitivity analysis. We can assess some of the effects of these individual sources of uncertainty. For example, recall that the direct labour payments were estimated as 34 percent of sales for the last three months because of a new wage scale. If this new wage scale was the result of a new labour contact that is yet to be negotiated when the forecast is made, the actual wage rate would be subject to uncertainty. Let us assess the effects of variation in the direct labour payments as a percent of sales on the projected surpluses and deficits in October, November, and December. This is done by changing the input variable and observing changes in the output variable. The first step might be to estimate the surpluses and deficits with direct labour at 36 percent of sales.

The results are presented in Table 8.1 The projected surplus in October drops from ₹ 12,300 to ₹ 7,800, the surplus in November drops from ₹ 1,01,400 to ₹ 93,000 and the project deficit in December increases from ₹ 3,600 to ₹ 15,000.

Table 8.1: Sensitivity Analysis of Cash Forecast (Direct Labour for October through December Changed to 36 Percent of Sales)

	May (Act.)	*June (Act.)*	*July (Ent.)*	*Aug. (Ent.)*	*Sept. (Ent.)*	*Oct. (Ent.)*	*Nov. (Ent.)*	*Dec. (Ent.)*
Sales	3,00,000	3,30,000	3,60,000	4,20,000	4,80,000	4,50,000	3,90,000	3,00,000
Cash Receipts Forecast								
Cash Sales			36,000	42,000	48,000	45,000	39,000	30,000
Collection : 1st Prior Month			1,98,000	2,16,000	2,52,000	2,88,000	2,70,000	2,34,000
Collection : 2nd Prior Month			87,000	95,700	1,04,400	1,21,800	1,39,200	1,30,500
Total Receipts			3,21,000	3,53,700	4,04,400	4,54,800	4,48,200	3,94,500
Cash Disbursements Forecast								
Direct labour Payments			1,22,900	1,42,800	1,63,200	1,62,000	1,40,400	1,08,000
Direct Material Payments			1,26,000	1,38,600	1,51,200	1,76,400	2,01,600	1,89,000
Monthly Material Payments			24,000	24,000	24,000	24,000	24,000	24,000
Tax Payments			—	—	1,32,000	—	—	1,32,000
New Construction			—	54,000	—	54,000	—	54,000
Total Disbursements			2,72,400	3,59,400	4,70,400	4,16,400	3,66,000	5,07,000
Net Cash Flow			48,600	−5,700	−66,000	38,400	82,200	−1,12,500
Beginning Cash			15,000	63,600	57,900	−8,100	30,300	1,12,500
Cash			63,600	57,900	−8,100	30,300	1,12,500	0
Total Desired Cash			18,000	21,000	24,000	22,500	19,500	15,000
Surplus or (Borrowings)			45,600	36,900	−32,100	7,800	93,000	−15,000

Notes

Another uncertain variable is the timing of payments for new construction. The weather pays a significant part in the rate of progress of construction. It is possible that the weather may be good and that the firm's construction company may progress ahead of schedule; instead of ₹ 54,000 being due in August. October, and December, this could result in ₹ 81,000 being due in August and October and nothing due in December. The results are presented in Table 8.2. Other variations in the timing of construction payments could also be investigated.

This kind of analysis provides very useful information about the amounts of possible surpluses and deficits in various future periods. With regard to the construction payments example, the expected amounts of surpluses and borrowings in the beginning and ending months are unaffected, but the pattern from September to November is significantly altered. The maximum amount of the firm's necessary borrowings is now ₹ 59,100, not ₹ 32,100 in the original calculation. If there is a significant chance that this speedup of construction may occur, the firm should make far different financing arrangements than were originally anticipated.

Table 8.2: Sensitivity Analysis of Cash Forecast: New Construction Payment Accelerates (in ₹)

	May (Act.)	*June (Act.)*	*July (Est.)*	*Aug. (Est.)*	*Sept. (Est.)*	*Oct. (Est.)*	*Nov. (Est.)*	*Dec. (Est.)*
Sales	3,00,000	3,30,000	3,60,000	4,20,000	4,80,000	4,50,000	3,90,000	3,00,000
Cash Receipts Forecast								
Cash Sales			36,000	42,000	48,000	45,000	39,000	30,000
Collection: 1st Prior Month			1,98,000	2,16,000	2,52,000	2,88,000	2,70,000	2,34,000
Collection 2nd Prior Month			87,000	95,700	1,04,400	1,21,800	1,39,200	1,30,500
Total Receipts			3,21,000	3,53,700	4,04,400	4,54,800	4,48,200	3,94,500
Cash Disbursements Forecast								
Direct Labour Payments			1,22,400	1,42,800	1,63,200	1,62,000	1,40,400	1,08,000
Direct receipt Payments			1,26,000	1,38,600	1,51,200	1,76,400	2,01,600	1,89,000
Monthly Fixed Expenses			24,000	24,000	24,000	24,000	24,000	24,000
Tax Payments			—	—	1,32,000	—	—	1,32,000
New Construction			—	81,000	—	81,000	—	—
Total Disbursement			2,72,400	3,86,400	4,70,400	4,43,400	3,66,000	4,50,000
Net Cash Flow			48,600	– 32,700	– 66,000	15,900	86,100	– 55,500
Beginning Cash			15,000	63,600	30,900	– 35,100	19,200	66,900
Total Cash			63,600	30,900	– 35,100	– 19,200	66,900	11,400
Desired Cash			18,000	21,000	24,000	22,500	19,500	15,000
Surplus or (Borrowing)			45,600	9,900	– 59,100	– 41,700	47,400	– 3,600

Simulation Analysis of the Cash Forecast

While sensitivity analysis methodologies give useful information, it is generally the overall variation from the means of the monthly cash deficits and surpluses that concerns management for planning purposes. This information on the probability distributions of cash surpluses and deficits is necessary to plan advantageous strategies. To estimate these probability distributions, a simulation of the overall uncertainty in the ending cash balances for cash of the period within the forecast is needed. To get these, the methods of simulation analysis are used. First, probability distributions for each of the major uncertain variables are developed. For cash forecast, the variables involved would include sales, collection rates, production costs, and capital expenditures. Statistical estimation procedures or management estimates could be used; discrete or continuous

distributions are possible. Then, large number of trials is run. From these trial results, frequency histograms of the important outcome variables would be developed and these compared to known probability distributions via goodness-of-fit methods.

To apply simulation analysis in estimating the total uncertainty in cash forecast, one of the uncertainties that must be quantified is that of the collection rates on accounts receivable. Uncertainty in the collection rates of receivables is an important component in the overall uncertainty of the cash forecast. The usual method of estimating these rates is to compute individual collection rates on various periods' sales using historic data. Another approach to the problem aids a quantifying the multivariate uncertainty in these rates. The approach estimates all the collection rates simultaneously by regressing past sales figures against past collections. The estimated collection of the sales figures in the regression can be interpreted as the collection proportions and the standard errors of the estimated regression collection as the uncertainty inherent in the estimation of this collection proportion.

Self Assessment

State whether the following statements are true or false:

7. Sales uncertainty is the uncertainty regarding the firm's actual future collection patterns of receivables.
8. Collection rate uncertainty refers to the risk regarding the firm's future levels of sales.
9. Production cost uncertainty has to do with the risk of the actual labour and material costs that go into the making of a product of service.
10. Capital outflow uncertainty is one of the biggest sources of surprises in cash flow forecasting.

8.4 Hedging vs Interest Rate

To understand the mechanics and alternative in holding, it is first necessary to understand a bit better why it is of advantage to the firm to hedge. At the end of cash period of the cash forecast, the firm expects to be in either a surplus or a deficit position. Let us examine the risks and cost that the firm would face if it did not hedge in cash of these cases. That is, assume that the firm keeps no cash, near-cash marketable securities, additional borrowing arrangements, or any other possible hedge.

If the firm is in a period of borrowing, at its maximum available borrowing limits (as determined by its credit line arrangements), and cash flows turn out to be less than expected (so that borrowing needs would be greater than expected), the firm would be faced with a substantial problems. All the solutions to this problem are costly.

Example: The firm could raise cash to cover the deficit by obtaining an emergency loan from its bank. However, bankers are not very receptive to emergency request of this type, and this solution could endanger the firm's relationship with its bank. Alternatively, the firm could delay one or more types of outflows, such as payments to trade suppliers. This would, of course, endanger relationships with these suppliers. Another strategy the firm might consider would be to sell an asset quickly to generate cash: but the rushed sale might net the firm less for the asset than if it sold the asset in a more considered fashion. In a time of surplus, where the firm has invested the extra funds in longer-maturity securities (to take advantage of yield curve effects), and the firm has another alternative: it may sell the investment prior to maturity. But by purchasing longer-term securities, the firm has subjected itself to interest rate risk; if interest rates have increased, the return on the investment will be reduced.

Notes

The point is that, without some kind of hedge against the uncertainties of future cash flows, the firm incurs costs that could be avoided by the use of a hedging strategy. Of course, there is a trade-off between the cost of the hedge and the expected costs that it avoids. It would not be cost-effective to hedge against all possible future costs if their probability of occurrence was very small. Because of this trade-off, it is necessary to understand the relative costs and other characteristics of the various methods commonly used to hedge the uncertainty of the firm's cash flows. Some of the possible hedging methods and their costs are discussed below:

Holding a Stock of Extra Cash

We refer here to a stock of cash kept by the firm beyond that needed for transactions. Cash is the most flexible but the most costly hedge available to the firm. It is the most flexible in that it can hedge a shortage in any circumstances, at any time, with no transaction costs. If the firm holds a stock of extra the temporary investment. Interest rate futures and options can also be used to hedge interest rate risks that do not arise as the result of uncertainties in the firm's cash flow, but instead occur solely because of changing interest rates between the time of the forecast and the planned investment of financing.

Basics of Interest Rate Futures Contracts

The discussion of futures can be obscured by the jargon of the futures market. Leaving the reader is bewildered and uninformed. If a few basic principles are kept in mind, much of this confusion can be avoided. First, we must always remember that the proper name for any future is a futures contract, with the emphasis on contract. A futures contract is just a contract between one party and another for the future delivery of a commodity. In this contract, the price and delivery date are specified. By specifying the price, both the buyer and seller are hedged against price fluctuations between the date on which the contract is sold and the delivery date. Futures contracts are commonly made on numerous types of goods.

And, since the futures contract specifies delivery at a fixed price but the market price of the commodity fluctuates with supply and demand, the value of the futures contract will fluctuate with the market price of the commodity. If the price of the commodity rises, so will the value of the futures contract specifying the purchase of the commodity at a lower price. However, one major difference between run-of-the-mill legal contracts for future delivery of goods and the future contracts discussed here is that these future contracts are traded on exchanges. This enables the parties to satisfy the contract and to realise gains or lasses before the maturity of the contract by selling the contract to a third party.

In these exchanges, the clearing house (which manages the exchange) guarantees the performance of both parties to the contract and offsets opposing transactions. An example of this offset procedure is useful. Suppose that a firm purchases a contract for the future delivery of a commodity. Later, it decides to take its gain or loss on this contract. It may do so by selling a contract for the delivery of the same commodity on the same delivery date at the same price. In the language of the futures market, the firm is both long in the contract (because it contracted to take delivery of the commodity) and short in the contract (because it contracted to deliver the commodity). In futures markets, the clearinghouse will net out these offsetting transactions, and the firms need not be involved thereafter.

When firm decides to take its gain or loss on a futures contract a large transfer of cash between the firm and its futures broker is not required. Most futures contracts are purchased on the margin; the firm givens the futures broker a relatively small deposit toward the total price of the contract. In the futures market, the amount of the deposit (the margin) is adjusted every day, and the firm gains or loses the difference in value. If the value of its contract goes up, the margin account with the futures broker is credited; if it goes down. The margin account is reduced.

Notes

This process is called marking to market. When the futures transaction is closed, the firm reclaims the balance in its margin account.

A very common mistake regarding futures contracts is to think of the margin requirement as an out-of-pocket transaction cost. Like a deposit on any purchase contract, the margin is eventually applied to the purchase pries should the buyer take delivery. If the buyer cancels the contract by taking an opposing position the margin is returned to the trader (less any losses and plus any gains). Thus, the margin requirement is a partial payment for the final goods, not a transaction cost.

Basics of Options on Interest Rate Futures Contracts

An option is a contract to purchase or sell something at a fixed price which may be exercised or not at the buyer's discretion. This is distinct from a future contract, which must be exercised, unless the futures contract is canceled via an opposing transaction. In the case of a futures contract, once the contract is canceled, the cost or benefit to the trader is the difference in price between the original cost of the contract and it cancellation cost, which is the difference in the trading price of the contract between when the trader went long and when he or she canceled via the short (or vice versa). In the case of the option, the cost of the option does not count toward the purchase price of the items in the contract, and the option does not have to be canceled it merely expires.

Thus, for an option, the firm faces an initial out-of-pocket cost. But relative to the futures contract, which locks in the future price of the commodity, the option offers greater flexibility. Since the option need not be exercised, the firm's costs are limited to the initial price of the option. If it is not profitable to exercise the option the firm need not do so. However, if movement in the price of the commodity on which the option is written turns out to be such that exercising the option is profitable, the firm may make gains by exercising the option or by taking an opposing position to the option and offsetting the positions. An option to sell an item for a fixed price over a fixed period is called a put option. An option to buy an item for a fixed price over a fixed period is called a call option.

The market prices of futures contracts on financial instruments and options on these contracts depend on the market price of the underlying financial instrument. For futures contracts, while the cash price of the instrument and the price of the instrument implied in the price future on this instrument are always closely related, they may diverge when the futures contract is fat from maturity. However, as the futures contract moves closer to maturity, the prices of the cash purchase of the good and the price of the good implied by the price of the futures contract for the good converge, until just before maturity the cash price of the good and the price implied by the futures contract on this good are the same. This occurs because purchasing a futures contract with a short time to maturity is virtually the same as purchasing the instrument itself.

For options on these futures contracts, the market price of the option depends on the relationship between the market price of the instrument and the exercise price of the option.

Did u know? **What is the exercise price of an option?**

The exercise price is the price at which an option is executed. For a put option, it is the price at which the instrument is sold to satisfy the option; for a call option it is the price at which the instrument is bought.

If the exercise price of a put option on a financial future is greater than the current market price of the future, then the value of the option must be at least the difference between the prices. This is necessary because, if it were less, any investor could buy the future, exercise

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the option to sell the future, and make a gain of the difference. If the current market price of the future is more than the exercise price of the put option the only value of the put option is that, over the remaining period, the market price might fall below the exercise price, giving the ability to make money. The reverse case between exercise price, market price, and option value occurs for call option.

Using Future and Options on Future to Liaise the Risk in the Cash Forecast

Interest rate futures contracts, and options on these contracts, can be used in two ways to hedge risk in cash forecast:

1. They can be used to hedge the interest rate risk on future borrowings and investments, or
2. They can be used to hedge the interest rate risk inherent in investing in longer-term instruments where an unexpected cash shortage may lead to selling these instruments before maturity.

Let us first consider the hedging of interest rates on future expected, borrowing and investing. Futures contracts on risk-free securities or options on these contracts can be used in conjunction with the cash forecast to lock in future rates on this expected borrowing and investment, and thus to hedge interest rate risk from the fluctuation in these rates between the time the cash forecast is generated and the time the borrowing or investing is to be executed.

To hedge the risk of changes in interest yields on investments, the firm may purchase a financial future in the investment instrument.

Because the use of a futures contract to hedge the interest rate of a future investment precludes the firm from investing should rates fall, some firms use options on futures contracts (rather than the futures contracts themselves) to hedge future investments even though there is an out-of-pocket cost to use the option. If options are used, the exercise of the option is at the discretion of the firm, and it may purchase securities directly in the market rather than through the option. In this way, it may benefit from rises in rates, though it is protected from their decline.

The process of hedging the interest cost on future needed financing is parallel to hedging the interest yield on future investing. However, with regard to financing, the firm wants to hedge a rate of borrowing (equivalent to selling debt securities), as opposed to lending (equivalent to buying debt securities). To hedge future borrowings, the firm may sell a futures contract on an investment instrument for future delivery (go short in the contract). When the firm must buy the investments for delivery to fulfill (cover) the short in the futures contract, the price of these instruments will have fallen, and the firm will make a gain on the futures transaction between the original selling price of the instrument (in the short sale) and the eventual covering price. If interest rates decline, the opposite effect occurs; the firm's borrowings are cheaper, but it takes a loss on the futures transaction (since it will now cost more to buy the securities to cover the short sale than the original short sale netted to the firm).

Like the purchase of a futures contract in anticipation of investment, the short sale of futures contract in anticipation of borrowing locks in the rate of borrowing. Similar to the investment case, the use of options on futures (rather than futures themselves) enables the firm to profit from fortuitous interest rate movements, but at the cost of the option To use an option to hedge future borrowing rates, the firm should purchase a put option on in futures contract.

Now let us consider the second application of these contracts in hedging the risks from the cash forecast: the risk of funds shortage. We previously discussed how hedges such as keeping a stock of cash and near-cash assets, investing temporarily surplus cash in near-cash assets rather than longer maturities, or arranging for excess borrowing capacity can address this risk. Recall that

Notes

when the firm has invested temporary cash in investments with maturities matching the expected future times when the cash will be needed (to take advantage of up-sloping yield curve effects), the firm is subject to interest rate risk should actual cash flows be such that the firm must liquidate these investments before maturity. Futures contracts themselves will not work in this situation because the firm does not know whether there will be a shortage which will necessitate the selling of the investments. The firm needs an instrument it can exercise if the shortage occurs, and it is forced to sell its investments. One possible strategy is to purchase a put option on a futures contract for investment securities.

Self Assessment

Fill in the blanks:

11. To hedge the risk of changes in interest yields on investments, the firm may purchase a ..... in the investment instrument.
12. It would not be cost-effective to hedge against all possible future costs if their probability of occurrence was very.....
13. An effective cash planning and management system should recognize the ..... and the.....of cash.
14. If the exercise price of a put option on a financial future is greater than the current market price of the future, then the value of the option must be at least the .....
15. An option is a contract to purchase or sell something at a fixed price which may be exercised or not at the ..... discretion.

8.5 Future and Options

Future contracts are organised/standardised contracts, which are traded on the exchanges. These contracts, being standardised and traded on the exchanges are very liquid in nature. In futures market, clearing corporation/house provides the settlement guarantee.

Options are instruments whereby the right is given by the option seller to the option buyer to buy or sell a specific asset at a specific price on or before a specific date.

Options are of two types – calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

Problems in Using Interest Rate Options and Futures for Hedging

There are two factors inhibiting the firm in efforts to construct hedges that completely eliminate the risk of interest rate fluctuations via futures contracts on options on these futures contracts. These problems are thin markets and basis risk.

In order to close out any position in futures or options on futures, the firm must either

1. Fulfill the contract by taking delivery of the instrument.
2. Take a position opposite to the original contract by selling a contract (for a long) or buying a contract (for a short). Take the loss or gain, and have the clearing house offset the transactions.

The latter strategy is by far the most popular, however, it requires that the firm make at least one additional transactional in the futures marketplace. In making these market transactions, it is

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very useful for the firm to be able to find a ready buyer or seller without the action of buying or selling affecting the market price of the contract. In this market, there are so few contracts traded that this may not be possible, the very act of closing out the position may reduce the firm's returns via the act's effect on the market price of the contracts. If the basis changes, or if the firm is not able to exactly match the principal value of the instrument with the principal value of the hedge (as in this case), the changes in the value of the instrument will not be exactly offset with changes in the value of the future or option.

While basis risk is a significant consideration in using futures and options to hedge risk, its importance should not be overemphasised. When the firm uses these hedges, the prime variable it is attempting to hedge is the overall level of interest rates. Compared to changes in these general levels, changes in the basis are often rather small. Despite problems of thin markets and basis risk, the use of futures, and options on these futures, provides results that are significantly safer than unhedged strategies.

Self Assessment

Fill in the blanks:

16. Options are instruments whereby the right is given by the option seller to the option buyer to buy or sell a specific ..... at a specific ..... on or before a specific date.
17. Future contracts are ..... contracts, which are traded on the exchanges.
18. The ..... is eventually applied to the purchase pries should the buyer take delivery.
19. The ..... of futures contract in anticipation of borrowing locks in the rate of borrowing.
20. Options are of two types – ..... and ..... .
21. A cash budget allows a firm to evaluate and plan for its .....
22. A very common mistake regarding futures contracts is to think of the ..... as an out-of-pocket transaction cost.

8.6 Summary

- Cash forecasting is extremely important to most firms.
- It enables them to anticipate periods of surplus cash and periods where financing will be necessary.
- This anticipation is the reason that cash forecasts are generated.
- Daily cash forecasts attempt to project cash inflows and outflows on a daily basis one or more days into the future.
- This is perhaps the most difficult forecasting to perform accurately.
- Even though a firm may know precisely its revenues for the month, it may have difficulty determining specific cash inflows for given days of the month.
- Collection rate uncertainty is the uncertainty regarding the firm's actual future collection patterns of receivables.

Notes

- The firm may historically have collected an average of a certain percent of its outstanding receivables from a particular period in another particular period, but this average contains considerable variability.
- Further, changing market and economic conditions may make for chancy extrapolation of post historic data into future period.
- A very common mistake regarding futures contracts is to think of the margin requirement as an out-of-pocket transaction cost.
- Like a deposit on any purchase contract, the margin is eventually applied to the purchase pries should the buyer take delivery.
- If the buyer cancels the contract by taking an opposing position the margin is returned to the trader (less any losses and plus any gains).
- Thus, the margin requirement is a partial payment for the final goods, not a transaction cost.

8.7 Keywords

Operating Cycle: The operating cycle of firm begins with the acquisition of raw materials and ends with the collection of receivables.

Opportunity Cost: The rate of return that can be earned on the best alternative investment.

Portfolio: A combination of assets.

8.8 Review Questions

1. Why should a financial manager focus on cash flow rather than earnings?
2. S.B. Mukherjee is considering the acquisition of personal computer and associated software to improve the efficiency of its inventory and accounts receivable management. Mukherjee estimates that the initiate cash outflow for the computer and software will be ₹ 1,50,000 and the associated net cash savings will be ₹ 30,000 annually.
   (a) If Mukherjee's discount rate for the cash flows associated with the project is 12 per cent and ` 30,000 savings will occur for only ten years (at which time the computer and software will be valueless), should he buy the computer?
   (b) What if the project last ten years but the discount rate is 16 per cent?
   (c) What if the project lasts forever and the discount rat is 12 per cent?
   (d) What if the project last forever and the discount is 16 per cent?
3. Why is it useful to separate major cash flows from minor ones in daily cash forecasting?
4. Why do corporations put so much emphasis on cash forecasts? What would happen if a company continually relied on inaccurate cash forecasts?
5. How can a company's cash position be measured for forecasting purposes? Why do manager generally prefer using the available bank balance?
6. R.D. Vasu, manager of the Royal Sports Club, is considering lowering the usage fee for the play ground. He estimates that this will result in an immediate (one-time) cash flow of ₹ 18, 00,000 from new membership fees. On the other hand, the annual net cash flow from usage fees is expected to fall by ₹ 3, 00,000 indefinitely (because of the lower fees).

Notes

(a) Should Vasu lower the usage fee if his discount ratio for this project in 20%?

(b) At what discount rate would he be indifferent to lowering the usage fee?

7. "The cash budget is just a glorified name for cash forecast." Comment on this statement, indicating whether you agree with it and why you think the statement was made.

8. What constitutes a useful forecast? What does usefulness include beyond forecast accuracy?

9. On what variable you would conduct sensitivity analysis for a simple cash budget and why?

10. If you were asked to forecast cash inflows from credit sales, what possible sources of data could you use?

11. Compare and contrast the scheduling approach with the distribution approach for daily cash forecasting. Which is more useful for which types of cash flows?

Answers: Self Assessment

1.	False	2.	True
3.	True	4.	Cash forecast
5.	surplus, periods	6.	Collection rate
7.	False	8.	False
9.	True	10.	True
11.	financial future	12.	small
13.	time value, opportunity cost	14.	price difference
15.	buyer's	16.	asset, price
17.	organised/standardized	18.	margin
19.	short sale	20.	calls, puts
21.	capital needs	22.	margin requirement

8.9 Further Readings

Books

D.R. Mehta, *Working Capital Management*, Prentice-Hall Inc., 1974.

J.Mcn Stancil, *The Management of Working Capital*, Intex, 1971.

K.V. Smith, *Readings in the Management of Working Capital*, West Publishing Company, 1980.

P. Gopalakrishnan and M.S. Sandilya, *Inventory Management*, Macmillan, 1978.

Online links

www.transactionservices.citigroup.com

www.workingcapitaldefinition.org

Unit 9: Cash Flows Forecasting and Treasury Management

Notes

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the objectives of cash forecasting
- Discuss the cash forecasting horizons
- Identify the methods of financial forecasting
- Explain the forecasting daily cash flows
- Describe the hedging cash balance uncertainties
- Identify the reasons for cash flow problems
- Discuss the management of treasury

Notes

Introduction

The cash forecast is an estimation of the flows in and out of the firm's cash account over a particular period of time, usually a quarter, month, week, or day. The cash forecast is primarily intended to produce a very useful piece of information: an estimation of the firm's borrowing and lending needs and the uncertainties regarding these needs during various future periods.

Cash forecasting is extremely important to most firms. It enables them to anticipate periods of surplus cash and periods where financing will be necessary. This anticipation is the reason that cash forecasts are generated. Anticipation enables the firm to plan much more effectively for investment and financing, and via these planning, produce superior returns.

Treasury Management function has changed dramatically during the last decade. From a mere facilitator of transactions, with few analytical tools, the task of treasury management has become a dynamic, quantitative function, providing service and often additional profits to the entire organisation.

Treasury management is central to corporate finance in practice. Even in smaller businesses, where no formalized treasury function exists, the main treasury activities of managing corporate funding, risk, banking relationships, liquidity and working capital will still be conducted. Government Bonds are also known as 'Treasuries'. The reference is to all bonds with no options such as call. Usually, government bonds do not have any options.

The terms like 'bonds', 'treasuries' or 'securities' are interchangeably used. We will cover some of the basic concepts and then look at the different techniques that allow the bankers/investors to measure the risks. By knowing the risks and the returns, one can make a proper decision about buying or selling the security. Banks over the years have invested very heavily in government treasuries.

The notion that money has a time value is one of the basic concepts in the analysis of any financial instruments. Money has a time value because of the opportunities of investing money at some interest rate. The three basic concepts those relate to the time value of money are:

- Future value of an investment
- Present value of an investment
- Internal rate of return or yield on an investment

Understand this concept will help the banks in making better investments and pricing the products and services of the banks.

9.1 Objectives of Cash Forecasting

As with the other short-term financial systems, it is helpful to outline an objective function for cash forecasting. Such an objective function might include the following factors:

1. ***Interest costs and Income:*** One major purpose of forecasting is to increase the firm's yield on its investment portfolio or depending on the firm's financial position, to decrease interest costs on its borrowing. Lack of an accurate forecast may force management either to invest in very short-term securities (thereby often earning the lowest yields) or to borrow unexpectedly at higher than usual interest rates.
2. ***Excess Balances:*** This may be considered a corollary to the first factor. Accurate daily cash forecasts enable management to reduce balances in disbursement and/or deposit accounts and thereby move otherwise non-interest- earning cash into other areas of the firm.

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3. ***Administrative Costs Benefits:*** Forecasting may require extensive administrative efforts to collect and digest data. On the other hand, forecasting may provide administrative benefits in the form of better planning and more timely management reports.
4. ***Control:*** Daily cash budgets often provide a standard against which deposit reports from the field can be compared. If actual deposit varies from project deposits, inquiries may be warranted.
5. ***Forecast System Costs:*** There costs are associated directly with developing, maintaining, and running the forecasting model and associated data bases. Some forecast systems require extensive computer time and information. Others are simple and inexpensive.

Designing forecasting systems requires that management make trade off among these five cost factors.

Example: An extensive, accurate forecasting system may be costly to build and maintain and may require strong administrative effort. But such a system may enable the firm to achieve better returns on its short-term investments, reduce borrowing costs, and exert better control over cash flows.

9.2 Cash Forecasting Horizons

Cash forecasting may be divided into roughly three sub problems. Depending on the horizon the forecaster wishes to consider. Different techniques and purposes are associated with each horizon.

9.2.1 Long-range Forecasts

Cash forecasts of one or more years into the future are needed primarily to assess the viability of the firm's long-range financing and operating policies. Long-range forecasts give planners an idea of how much cash the firm needs to raise through debt or equity issues, internally generated cash, or other cash sources. These forecasts also assist managers in establishing dividend policies, determining capital investments, and planning a mergers and acquisitions (or divestitures) programme. It is typical for a firm to have a 5 or 10-year forecast that is updated annually.

Long-range forecasts are generally based on accounting projections and typically involved the generation of various scenarios for future economic and technological environments. Such forecasts are considered strategic in the sense that possible major changes are examined.

9.2.2 Medium-range Forecasts

We consider medium-range forecasts to be those that cover cash flows during the next 12 months. A firm may have, for example, a forecast of quarterly cash flows over the next 4 quarters, with monthly detail over the next 3 months. Medium-range cash forecasting usually takes the firm's existing technology and long-range financing as given. Hence, this kind of forecast is considered tactical rather than strategic. Although it can be accounting based, adjustments are made to focus on cash flows rather than earnings. It is sometimes called cash budgeting.

Did u know? **What is the purpose of medium-range forecasting?**

The purpose of medium-range forecasting is to determine the firms need for short-term cash from credit lines, commercial paper sales, or credit and payables policies. It also

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helps firms to determining the makeup of their short-term investment portfolio. When a firm performs the task called budgeting, it generally designates the most likely (or most desirable) scenario of the medium-range forecasts as the budget. The budget is used to compare actual performance during the course of the year.

9.2.3 Daily Cash Forecasts

Daily cash forecasts attempt to project cash inflows and outflows on a daily basis one or more days into the future. This is perhaps the most difficult forecasting to perform accurately. Even though a firm may know precisely its revenues for the month, it may have difficulty determining specific cash inflows for given days of the month. For some firms, A daily forecast several months into the future is possible. For most, however, a forecast even 2 days into the future is difficult.

Did u know? **What is the purpose of daily forecasting?**

The purposes of daily forecasting are to assist management in scheduling transfer in cash concentration, funding disbursement accounts, controlling field deposits, and making short-term investing and borrowing decisions.

Self Assessment

Fill in the blanks:

1. …….are also known as 'Treasuries'.
2. ……give planners an idea of how much cash the firm needs to raise through debt or equity issues.
3. …….forecasts attempt to project cash inflows and outflows on a daily basis one or more days into the future.

9.3 Methods of Financial Forecasting

Financial forecasting is the estimation of the future level of a financial variable, often a cash flow, asset level, or liability level. It is usually assumed that the relationship between the financial variable and other variables is linear. The general linear model can then be used.

$$Y_t = a_a + a_1X_1 + a_2X_2 \ldots\ldots\ldots a_nX_n \quad (1)$$

Here, Y is the financial variable (Y) to be forecast in period t. This X's are the explanatory variables, they are assumed to cause the level of Y in period t. The a term represents a constant unaffected by the X's. The other terms are the estimated Coefficients of the explanatory X variables. There are n terms with X's in them. This general methodology will be clearer as examples are presented. It is understood that any forecast made in this way is subject to some prediction error because of uncertainty about the exact relationship between the explanatory variables (the X's) and the outcome variable (the Y; that is, uncertainty about the a coefficients). There are four common approaches to forecasting financial variables, but they are all special cases of the general linear model. These four methods are discussed as follows.

9.3.1 Spot Method

Here it is assumed that the variable to be forecast is independent of all other variables, or alternatively, is predetermined. The variable is forecast by using its expected or predetermined level. All other explanatory variables are presumed to be irrelevant and the formula used is

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$$Y_1 = a_0 \quad (2)$$

where a is the expected or predetermined level of Y.

Example: If we are doing cash forecast and we know that the level of particular types of disbursement (such as rental payments) will be ₹ 12,000 in every month because of the firm's lease agreement, it would be reasonable to use the spot method to estimate rental payments as ₹ 12,000 per month.

9.3.2 Proportion of another Account

This technique is used to project financial variables that are expected to vary directly with the level of another variable. The formula used is:

$$Y_1 = a_1 X_1 \quad (3)$$

where X_1 is the other variable to which Y is related and a_1 is the constant of proportionality between the two. The "percent of sales" method is a variation of this technique, wherein X_1 is sales for a particular period and a_1 is the percent. The "proportion of another account" method is widely used, when there is a causal link from the explanatory variable to the variable to be forecast.

Example: If sales volume (units sold) increases, it is natural that more units will have to be produced to replenish inventory. It is then reasonable to project certain direct costs of production, such as direct materials, as a percent of sales In this circumstance, if costs of direct materials have historically been 50 percent of sales, and sales for a particular period have been forecast as ₹ 1, 00,000, the firm would normally project direct material purchases at ₹ 50,000 for that period.

9.3.3 Compounded Growth

This method is used when a particular financial variable is expected to grow at a steady growth rate over time. The formula is the same as equation (3), but the explanatory variable X_1 is the prior period's level of Y, and a is one plus the expected growth rate. That is:

$$Y_t = (1+g)Y_{t-1} \quad (4)$$

Where g is the period's growth rate.

Example: If it is expected that a firm's level of selling expenses will grow at 10 percent per year, and this year's selling expenses are ₹ 10,00,000, we would project next year's selling expenses as ₹ 1,00,000.

9.3.4 Multiple Dependencies

Here the variable is thought to depend on more than one factor; not just sales or some other variable but a combination of several variables. The general linear model as expressed in equation (1) is used, and the statistical technique of linear regression is often employed with historic data to estimate which explanatory variables are significant in determining Y and to estimate the coefficients of these variables. A classic example of multiple dependencies is inventory level. Finns often keep a "base level" or "safety stock" of inventory to hedge uncertainty and vary the remaining portion of inventory in response to demand. In such a system, there are two appropriate variables associated with inventory level:

Notes

$$Y_t = a_0 + a_1 X_1 \quad (5)$$

There a_0 term represents the base inventory level, the X_t the square root of the sales level, and at the proportionality constant. If the firm's base level of inventory is ₹ 50,000, the proportionality constant is 15 and sales are expected to be ₹ 5,00,000, we could estimate inventory as:

$$Y_t = 50{,}000 + (15)\ ((500{,}000)^{1/2}) = ₹\ 60{,}607$$

In deciding which of these methods to use to forecast a particular variable, a primary consideration is the term of the forecast: how far into the future are we projecting? To see this, the concepts of the short-run and the long-run from economics can be employed. In the short-run, most things are predetermined or preplanned; very little can be changed. In the long-run, almost everything is variable. In terms of financial forecasting, this means that in short-term forecasts, many things will result from plans and events that are already in place (contracts, capital budgets, long-range financing plans, and so forth). But in the long run, most things can vary and are dependent on outside influences such as the firm's long-term growth rate. Since cash forecasts deal mostly with the near future, many of the items on the cash forecast are estimated by some variation of the spot method. The bases for these spot estimates are usually the firm's other financial plans. Remaining estimates are mostly in a "proportion of another account" basis, with this "other account" often being a particular period's scales; the other two methods are employed less frequently. This is quite unlike longer-term forecasting. Where compounded growth and multiple dependency methodologies play a more important role.

Self Assessment

Fill in the blanks:

4. In ……..it is assumed that the variable to be forecast is independent of all other variables, or alternatively, is predetermined.
5. ……technique is used to project financial variables that are expected to vary directly with the level of another variable.
6. ……method is used when a particular financial variable is expected to grow at a steady growth rate over time.

9.4 Forecasting Daily Cash Flows

Forecasters typically use scheduling for daily cash forecasts, especially for short horizons. Statistical tools can be helpful for the recurrent, non-major elements in the forecast, however. Many smaller and some medium-sized companies do not even forecast on a daily basis, relying on funding from investments or credit lines to cover shortfalls. The uncertainty of cheque clearing is managed with controlled disbursement accounts. As the opportunity cost for suboptimal investing increases due to increasing interest rates. More companies find it profitable to do daily forecasts.

For most companies doing daily forecasting, the immediate day's flows are simply gathered from balance-reporting systems. For the next day and up to two weeks in the future, historical collection and payment patterns can be used in connection with sales and purchases to project cash flows.

The shorter the horizon, the more detail shown in the cash forecast. Ideally, the format will include columns for the forecast, the actual amount (as it materialises), the budgeted amount, and variances. Typically, actual-versus-forecast and actual-versus-budget variances will be calculated. Explanations of likely causes and corrective actions will accompany the numbers.

Notes

With the requirement to present a Statement of Cash Flows, some companies are finding it fruitful to prepare their cash forecasts with separate subtotals for operating, financing, and investing cash flows. While the Statement of Cash Flows format might be more appropriate for a monthly forecast, it can be used for daily forecasts as well.

The major differences when it comes to modeling the daily cash flow are a and greater reliance on bank-supplied deposit and cleaning data, an emphasis on scheduling the upcoming cash flows via the receipts and disbursements technique, and a lesser reliance on statistical forecasting techniques. Scheduling upcoming cash receipts and disbursements requires close contact with any corporate personnel having responsibility for or knowledge of impending cash flows. Cash managers who have not yet discovered computers have been known to write these flows down on their desk calendars!

One area where statistics have been instrumental in achieving accuracy is for spreading out (distributing) cheque clearing or receivable cash effects throughout the days of the week and month. Here regression analysis has been very useful, in that the day-of-the week and even day-of-the month effects can be modeled by assigning each a separate regression coefficient. The regression-based distribution method also has been used to model the cash disbursements related to how many business days have elapsed since payroll cheque has been issued. In general, distribution simply refers to spreading out the month's cash forecast into daily flows, thereby showing the intramonth cash flow pattern. We can illustrate this in the disbursements context by assuming that October's total disbursement is forecast to be ₹ 40,00,000. We can forecast the disbursements for Friday, October 13, which is the eleventh work day of the month.

$$CD_{11} = (d_{11} + w_5) \times MDF$$

where

CD_{11} = cash disbursement forecast for the eleventh work day of the month

d_{11} = coefficient for eleventh work day (from regression model)

w_5 = coefficient for fifth day of work, Friday (from regression model)

MDF = month's disbursement forecast (from cash budget)

If we assume that d_{11} is (.04, w_5 is .015 and MDF is ₹ 40,00,000)

we have:

$$CD_{11} = (.04 + .015) \times (₹\ 40,00,000)$$

$$= (.055) \times (₹\ 40,00,000)$$

$$= ₹\ 2,20,000$$

One can think of the workday coefficient as the effect of the day-of-the-month effect, holding constant the day-of-the-week, and the day-of-week coefficient as to that day's effect holding constant the day-of-the-month.

9.5 Hedging Cash Balance Uncertainties

The point is that, without some kind of hedge against the uncertainties of future cash flows, the firm incurs costs that could be avoided by the use of a hedging strategy. Of course, there is a trade-off between the cost of the hedge and the expected costs that it avoids. It would not be cost-effective to hedge against all possible future costs if their probability of occurrence was very small. Because of this trade-off, it is necessary to understand the relative costs and other characteristics of the various methods commonly used to hedge the uncertainty of the firm's cash flows. Some of the possible hedging methods and their costs are discussed below:

Notes

9.5.1 Holding a Stock of Extra Cash

We refer here to a stock of cash kept by the firm beyond that needed for transactions. Cash is the most flexible but the most costly hedge available to the firm. It is the most flexible in that it can hedge a shortage in any circumstances, at any time, with no transaction costs. If the firm holds a stock of extra the temporary investment. Interest rate futures and options can also be used to hedge interest rate risks that do not arise as the result of uncertainties in the firm's cash flow, but instead occur solely because of changing interest rates between the time of the forecast and the planned investment of financing.

Illustration 1: Global Recreation Centers is attempting to forecast cash receipts from its Eastern Division. Cash is deposited into two field banks on a daily basis. The cash manager has found that deposits follow a fairly strong day-of-week pattern. She used historical data to determine the fraction of each week's total revenues deposited by day-of-week by district. Combined with weekly revenue estimates the fractions help her estimate daily deposits from Eastern Division. The parameters obtained from the past 3 months' deposit data follow:

Day of Week	District 1 using Deposit Bank 1	District 2 using Deposit Bank 2
Monday	36.0 %	31.0%
Tuesday	13.0	15.0
Wednesday	17.0	17.0
Thursday	15.0	20.0
Friday	19.0	17.0
	100.0%	100.0%

Weekly revenue estimates from the sales department were also obtained:

Day of Week	District 1	District 2
Week 1	₹ 68,000	₹ 52,000
Week 2	₹ 39,000	₹ 44,000

Solution:

To forecast daily deposits into each bank, we simply multiply the weekly revenue by the day-of-week percentage and sum across the two districts.

Table 9.1

	District 1 (Bank 1)			District 2 (Bank 2)			Total Daily
Day	**Fraction**	**TOT/Week**	**Daily**	**Fraction**	**TOT/Week**	**Daily**	**Deposit**
Mon	36.0	₹ 68,000	₹ 24,480	31.0%	₹ 39,000	₹ 12,090	₹ 36,570
Tue	13.0	68,000	8,840	15.0	39,000	5,850	14,690
Wed	17.0	68,000	11,560	17.0	39,000	6,630	18,190
Thu	15.0	68,000	10,200	20.0	39,000	7,800	18,000
Fri	19.0	68,000	12,920	17.0	39,000	6,630	19,550
Mon	36.0	52,000	18,720	31.0	44,000	13,640	32,360
Tue	13.0	52,000	6,760	15.0	44,000	6,600	13,360
Wed	17.0	52,000	8,840	17.0	44,000	7,480	16,320
Thu	15.0	52,000	7,800	20.0	44,000	8,800	16,600
Fri	19.0	52,000	9,880	17.0	44,000	7,480	17,360
Total		₹ 1,20,000	₹ 1,20,000		₹ 83,000	₹ 83,000	₹ 2,03,000

Notes

HP Apples Company has a seasonal pattern of its business. It borrows under a line of credit from Central Bank at 1.50 per cent over prime. Its total asset requirements were (at year end) and estimated requirement for the coming year are:

	Now	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Amount	₹ 90 cr.	₹ 96 cr.	₹ 110 cr.	₹ 118 cr.	₹ 100 cr.

The prime rate at present is 10.50 per cent, and the company expects no change in this rate for the next year, H.P. Apples Company is also considering issuing intermediate term debt at an interest rate of 14.00 per cent. In this regard three alternative amounts are under consideration: Zero, ₹ 10 crore, and ₹ 20 crore. All additional funds requirements will be borrowed under the company's bank line of credit.

(a) Determine the total borrowing costs for short-and intermediate-term debt under each of the three alternatives for the coming year, assuming there are no changes in current liabilities other than borrowings. Which is lowest?

(b) Are there other consideration in addition to expected cost?

Solution:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Alternative 1:	₹ 6 crore	₹20 crore	₹28 crore	₹10 crore	
incremental borrowings	₹18 crore	₹60 crore	₹84 crore	₹30 crore	₹1.92 crore
Bank loan cost crore (10.5% + !%)/ 4 = 3% per quarter					
Alternative 2:					
Term loan cost (₹20 crore at 14%)					₹1.40 crore
incremental borrowings		₹ 10 crore	₹18 crore		
Bank loan cost crore		₹30 crore	₹54 crore		₹84 crore
					₹ 2.24 crore
Alternative 3:					
Term loan cost (₹20 crore at 14%)					₹ 2.80 crore
incremental borrowings			₹8 crore		
Bank loan cost			₹24 crore		₹24 crore
					₹3.04 crore

(a) Alternative is lowest in cost because the company borrows at a lower rate, 12 per cent versus 14 per cent, and because it does not pay interest on funds employed when they are not needed.

(b) While alternative I is cheapest it entails financing the expected build up in permanent funds requirements (₹10 crore) on a short-term basis. There is a risk consideration in that if things turn bad the company is dependent on its back for continuing support. There is risk of renewal and of interest rates changing. Alternative 2 involves borrowing the expected increase in permanent funds requirements on a term basis. As a result, only the expected seasonal component of total needs would be financed with short-term debt. Alternative 3, the most conservative financing plan of the three, involves financing on a term basis more than the expected building-up in permanent funds requirements. In all three cases, there is the risk that actual total funds requirements will differ from those that are expected.

Notes

Task A firm has generated a cash forecast that shows the following pattern of surpluses over the next four months:

Month	March	April	May	June
Surplus	₹25,00,000	₹17,00,000	₹20,00,000	₹0

The yield curve is upsloping and has the following rates and maturities:

Time of Maturity	Uncompounded Yearly Rate
1 month	9.00%
2 month	9.60%
3 month	10.00%

Generate a bar chart of the surpluses over time. Using this bar chart, formulate an investment strategy for the investment of surplus funds. In formulating this investment strategy, assume that the firm has hedged the cash stockout risk; the surplus amounts can thus be treated as certain. Ignoring transaction costs, calculate the interest income from your investment strategy.

Case Study

Desai Enterprises

Desai Enterprises currently sells on term of 2/10, net 40, with bad debt losses running at 2 percent of gross sales. Of the 98 per cent of the customers who pay, 60 per cent take the discount and pay on Day 10, while 40 per cent pay on Day 40. The firm's gross sales are currently, ₹ 10,00,000 per year, with variable costs amounting to 60 per cent of sales. The firm finances its receivables with 10 per cent line of credit, and there are sufficient fixed assets to support the doubling of sales.

The firm finance manager has proposed the credit terms be changed to 2/20, net 60, and he estimates that this change would increase sales to ₹11,00,000, However, bad debt losses at the new sales level would be 3 per cent, compared with only 2 per cent at the old sales level. It is expected that 75 per cent of the paying customers would take the discount under the new terms, paying on Day 20, while 25 per cent would now pay on Day 60.

(a) What are the old and new day's sales outstanding?

(b) Find change in investment (A I) in receivables.

(c) Find the incremental change in profits before tax (A PBT) if the change in credit terms be adopted.

(d) Assume that the firm's competitions immediately react to the change in credit terms by easing their own term. This causes Desai to gain no new customers, however, of the existing buyers who pay (2 per cent continue as bad debt losses), 75 per cent now take the discount and pay on Day 20, with 25 per cent pay on Day 60. What is the effect on the firm's profits before tax?

(e) The responsiveness of sales to a proposed change in credit terms is, of course, uncertain. Suppose that the firm implemented the finance manager's policy, but the sales may rise to ₹ 10,50,000 or may fall to ₹ 10,25,000. What change in profits before tax will generate? Assuming that all other aspects of his forecast actually occur.

Contd...

Notes

(f) Considering the firm's original terms, collection experience, and level of sales, if the finance manager decides to shorten the collection period by tightening the credit term to 2/10 not 30. If bad debt losses remain 2 per cent of gross sales and collection percentages are expected to .remain at 60 and 40 per cent but the gross sales decline to ₹ 9,00,000. Would this decision be advisable?

Self Assessment

Fill in the blanks:

7. …….typically use scheduling for daily cash forecasts, especially for short horizons.
8. The ……..the horizon, the more detail shown in the cash forecast.
9. …….refers to the risk regarding the firm's future levels of sales.

9.6 Reasons for Cash Flow Problems

A cash flow problem arises when a business struggles to pay its debts as they become due. Business has a cash flow problem if any of these in the cash flow statement:

1. Cash outflows are constantly bigger than cash inflows
2. Business keep increasing in bank overdraft (closing balance is minus)
3. Business keeps taking out other kinds of loan or put in more capital to keep the firm going

Notes A cash flow problem is not necessarily the same as experiencing a cash outflow. A business often experiences a net cash outflow.

Example: When making a large payment for raw materials, new equipment or where there is a seasonal drop in demand.

Working capital consists of cash, invoices sent by the business which customers have not yet paid, and stock. Of these three, only cash can be used to pay outstanding bills.

Notes The more of the working capital is tied up in stock and outstanding invoices, the more likely it is that the business has a cash flow problem.

However, when cash flow is consistently negative and the business uses up its cash balances, then the problem becomes serious. There are a lot of popular phrases used in describing financial issues experienced by many businesses. A couple such phrases are "Cash is King" or "Cash is the Life Blood of a Business." Both are phrases that become very real at some point in time with most businesses.

A few years ago a study was done on the financial status of companies filing bankruptcy. The outcome of that research turned up the fact that over 50% of the companies that filed bankruptcy showed a year-end profit. It wasn't profitability that created their problems, it was cash flow. They lacked sufficient liquidity (cash) to pay their creditors based on agreed upon terms or contracts. Profitability only indicates that your sales were sufficiently larger than your expenses but it doesn't mean that you have yet received the income generated by those sales. You may

Notes

have a lot of those profits tied up in A/R and other illiquid assets. This is why so many find invoice factoring to be a great solution.

Causes of Cash Flow Problems

The causes of poor cash flow can be either external or internal factors.

Did u know? **What are external factors?**

The external factors are those that occur outside of the business and its control. While we may not be able to control external factors we can prepare and reduce the risk and impact of them on our business. Internal factors are those that are within the control of our business.

External factors can have a large and frustrating influence on small business and its cash flow. They can also be overlooked by small business as part of the reason for poor cash flow. If overlooked the small business will not be able to effectively improve its cash flow.

The main causes of cash flow problems are:

(a) ***Low profits or (worse) losses:*** There is a direct link between low profits or losses and cash flow problems. Remember – most loss-making businesses eventually run out of cash.

(b) ***Bad debt:*** Customers that don't, won't or can't pay their bills.

(c) ***Slow Paying Accounts:*** Customers that do not pay as agreed and end up using you for an interest free loan.

(d) ***Over-investment in capacity:*** This happens when a business spends too much on production capacity. Factory equipment which is not being used does not generate revenues – so is often a waste of cash.

(e) ***Down-turn in Revenue:*** Loss of some of your accounts creating a sudden decrease in sales.

(f) ***Increase in Expenses:*** A sudden increase in the cost of doing business such as, skyrocketing fuel costs, unexpected equipment repairs, increased insurance premiums, uninsured costs from damage claims.

(g) ***Seasonal demand:*** Predictable changes in seasonal demand create cash flow problems – but because they are expected, a business should be able to handle them.

(h) ***Sudden or rapid growth:*** Rapid growth with an increase in overhead which is due prior to receipt of revenue generated from those sales.

(i) ***Too much stock:*** Holding too much stock ties up cash and there is an increased risk that stocks become obsolete (i.e. it can't be sold).

(j) ***Under-capitalized:*** Not having and cash savings or safety net when unusual demands for cash occur.

(k) ***Allowing customers too much credit***: Customers who buy on credit are called "trade debtors". Offering credit to customers is a good way to build revenue, but late payment is a common problem and slow-paying customers put a strain on cash flow.

(l) ***Using Cash or Short-term Financing to Purchase Long-term Assets:*** Using cash or short-term financing to acquire an asset that should have been purchased with long-term debt (resulting in lower payments and therefore a reduced impact on cash reserves).

Notes

(m) ***Overtrading:*** This occurs where a business expands too quickly, putting pressure on short-term finance.

Example: A retail chain might try to open too many stores too quickly before each starts to generate profits.

9.7 Treasury Management

Treasury management is defined as "the corporate handling of all financial matters, the generation of external and internal funds for business, the management of currencies and cash flows and the complex strategies, policies and procedures of corporate finance".

In today's exceptionally volatile financial markets and complex business environment, successful companies are directing their efforts aggressively to strengthen their treasury management strategy and tactics for accelerating cash flow, ensuring better management of unused cash, enhancing the performance of near cash assets, optimising their capital structure and financing arrangements, identifying and managing treasury risks and introducing more efficient and control oriented processes. The role of the Treasury function is rapidly changing to address these challenges in an effort to achieve and support corporate goals.

Cash has often been defined as "King" and it is. However, it is no longer good enough just to mobilise and concentrate cash and then invest it overnight with pre-tax returns barely exceeding 5% when the cost of short and longer-term debt is significantly greater. The entire treasury cycle needs to be evaluated more closely. Questions such as, how can we harvest our cash resources better, where can we achieve the most efficient utilisation of our financial resources, and what are our alternative needs to be answered. Treasures and Chief Financial Officers (CFOs) need to get closer to the process of the overall treasury cash and asset conversion cycle (sales/revenue generation/cash flow) to better understand how, when and where cash will flow and then to take steps to enhance its utilisation.

An effective, and efficient treasury management operations predicts, analyses and resolves the following questions which arise during business operations.

- Do and will we have enough cash flow and funds available?
- Are our near cash assets effectively utilised?
- Should we pay down debt? Take on more debt?
- Should we hedge our interest and currency risk exposures?
- Where do our risks exist? What is the impact of those risks?
- How effective is our risk identification and control processes?
- How are these risks being mitigated? Are the methods adopted for mitigating risk effective?
- Do we have enough experienced human resources?
- Do we have the right tools and technology?
- Are we actively identifying opportunities to unlock value?
- Are we implementing effectively and are alternatives properly evaluated?
- Are our Financial Risks managed within a reasonable tolerance level?

Notes

By optimising the treasury operations and related risk management process, the companies can reap significant benefits such as:

- Improve cash flows, enhance return or reduce interest expense.
- Put money on the table.
- Reduce excessive and unnecessary costs.
- Introduce more effective technologies.
- Enhance the utilisation of near cash assets.
- Better control and mitigate operational and financial risks.
- Streamline banking structure.
- Strengthen controls and procedures.

9.7.1 Treasury Risk Management

A few of the main focus areas of treasury operations are as follows:

1. ***Cash Flow-Receipts and Disbursements:*** Accelerating the collection of cash receipts and mobilisation/consolidation of cash, improving effectiveness of lockboxes; cheque clearing, credit card payments, wire transfer systems, and electronic commerce initiatives to optimise cash utilisation. Design and operate effective and control oriented payment and disbursement systems.
2. ***Bank and Financial Institution Relations:*** Assess global banking and financial institutions relationships among themselves as well as with domestic ones and identify ways to maximize the value of these relationships. Enhance the value received from banking and financial products and implement more efficient processes and account structures to strengthen global cash and treasury risk management. Review capital structure and financing arrangements to maximise the utilisation of financial resources and minimise their cost.
3. ***Cash Management Controls:*** Assess and improve controls to minimise exposure to fraud and other such risks. This also strengthens and supports internal control initiatives.
4. ***Cash Forecasting and Information Reporting:*** Improve the reliability, accuracy and timeliness of data from domestic and international cash forecasting models and processes; and improve the effectiveness of treasury information reporting.
5. ***International Cash Management:*** Optimize global cash and treasury risk Management by improving Foreign Exchange (FX) management system.
6. ***FX and Interest Rate Management:*** Evaluate foreign exchange and interest rate practices and strategy to identify measure, manage and monitor these activities. Also, assess opportunities for improvement.

The two main focus areas of treasury operations are:

(i) Fund management, and

(ii) Financial risk management.

The former includes cash management and asset liability mix. Financial risk management includes forex and interest rate management apart from managing equity and commodity prices and mitigating risks associated with them.

Notes

9.7.2 Functions of the Treasury Department

The important functions of a treasury department are as follows:

1. Setting up corporate financial objectives
   - (a) Financial aim and strategies
   - (b) Financial and treasury policies
   - (c) Financial and treasury systems.
2. Liquidity Management
   - (a) Working capital management
   - (b) Money transmission and collection management
   - (c) Banking relationships.
3. Funding Management
   - (a) Funding policies and procedures
   - (b) Sources of funds (Domestic, International, Private, Public)
   - (c) Types of fund (Debt, equity, hybrid).
4. Currency Management
   - (a) Exposure policies and procedures
   - (b) Exchange dealings including, hedging, swaps, future and options
   - (c) Exchange regulation.
5. Corporate Finance
   - (a) Business acquisitions and sales
   - (b) Project finance and joint ventures.

The main functions of the treasury department can be broadly classified as follows:

(a) raising of funds

(b) managing interest rate and foreign exchange exposure, and

(c) maintenance of liquidity.

Raising of funds in not a regular activity. During normal operations the funds which have already been raised are used for operations, but when the firm opts for new projects, or when the firms go for backward and forward integration, additional amount of funds are required. In these cases the treasury department has to look out for different sources of funds and decide upon the source.

Caution The treasury department will also decide the manner in which funds are to be raised viz., it should be either be through a public issue or private placement, through debt or equity.

With the growing globalisation of economies all over the world, companies are increasingly exporting and importing goods and services. This gives rise to the problem of foreign exchange exposure.

Notes

Example: Company A exports goods worth ₹44, 000, as of today which is equivalent to $1000 assuming an exchange rate of ₹44 = 1$. The payment for this export order will be received after 3 months. During this intervening period if the Indian rupee appreciates in comparison to dollar by 5% i.e., ₹ 41.80 = 1$ the effective receipt after 3 months would be ₹41, 800 only. In order to avoid this company could take a forward cover through which the unfavourable movement in currency prices is evened out.

The main function of the treasury department is to maintain liquidity. Liquidity here implies the ability to pay in cash the obligations that are due. Corporate liquidity has two dimensions viz., the quantitative and qualitative aspects. The qualitative aspects refer to the ability to meet all present and potential demands on cash in a manner that minimises costs and maximizes the value of the firm. The quantitative aspect refers to quantum, structure and utilisation of liquid assets.

Notes Excess liquidity (idle cash) leads to deterioration in profits and decreases managerial efficiency.

It may also lead to dysfunctional behaviour among managers such as increased speculation, unjustified expansion and extension of credit and liberal dividend. On the other hand a tight liquidity position leads to constraints in business operations leading to, reduced rate of return and missing on opportunities. Therefore, the most important challenge before the treasury department is to ensure the 'proper' level of cash in a firm.

Self Assessment

State whether the following statements are true or false:

10. There is a direct link between low profits or losses and cash flow problems.
11. The internal factors are those that occur outside of the business and its control.
12. External factors are those that are within the control of our business.

9.8 Summary

- The cash forecast is an estimation of the flows in and out of the firm's cash account over a particular period of time, usually a quarter, month, week, or day.
- Long-range forecasts are generally based on accounting projections and typically involved the generation of various scenarios for future economic and technological environments.
- The purposes of daily forecasting are to assist management in scheduling transfer in cash concentration, funding disbursement accounts, controlling field deposits, and making short-term investing and borrowing decisions.
- While sensitivity analysis methodologies give useful information, it is generally the overall variation from the means of the monthly cash deficits and surpluses that concerns management for planning purposes.
- This information on the probability distributions of cash surpluses and deficits is necessary to plan advantageous strategies.
- To estimate these probability distributions, a simulation of the overall uncertainty in the ending cash balances for cash of the period within the forecast is needed. To get these, the methods of simulation analysis are used.

Notes

- A cash flow problem arises when a business struggles to pay its debts as they become due. The more of the working capital is tied up in stock and outstanding invoices, the more likely it is that the business has a cash flow problem.
- Treasury management is defined as the corporate handling of all financial matters, the generation of external and internal funds for business, the management of currencies and cash flows and the complex strategies, policies and procedures of corporate finance.

9.9 Keywords

Cash forecast: The cash forecast is an estimation of the flows in and out of the firm's cash account over a particular period of time, usually a quarter, month, week, or day.

Compounded growth: This method is used when a particular financial variable is expected to grow at a steady growth rate over time.

Daily cash forecasts: Daily cash forecasts attempt to project cash inflows and outflows on a daily basis 1 or more days into the future.

Financial forecasting: Financial forecasting is the estimation of the future level of a financial variable, often a cash flow, asset level, or liability level.

Long-range forecasts: Cash forecasts of one or more years into the future are needed primarily to assess the viability of the firm's long-range financing and operating policies.

Medium-range forecasting: We consider medium-range forecasts to be those that cover cash flows during the next 12 months.

9.10 Review Questions

1. What are the objectives of cash forecasting?
2. Briefly explain the cash forecasting horizons.
3. What are the methods of financial forecasting?
4. Discuss the forecasting of daily cash flows. Also write down the sources of uncertainty in cash forecasting.
5. Explain the hedging cash balance uncertainties.
6. What is meant by a cash flow problem?
7. Write down the reasons for cash flow problem.
8. What is Treasury? Briefly explain the treasury risk management.
9. It is June 30 and the treasurer of the ABC Toy Company is trying to forecast cash inflows for the last 6 months of the year. The following credit sales information (in crore of rupees) is available:

Apr	₹ 30	May	₹ 35	Jun	₹ 30	Actual
Jul	45	Aug	70	Sep	150	Forecast
Oct	200	Nov	125	Dec	45	

From prior studies, the treasurer has determined that approximately 85% of the sales for any month are uncollected at the end of the month of the sale, 60% are still uncollected 1 month after the sale, and 10% are uncollected 2 months after the sale. That last 10%, with the exception of bad debts, which average 2% of sales, are collected in the third month after the sale.

Notes

(a) Forecast the case inflows, by months, for July through December for ABC Toys.

(b) Forecast the accounts receivable at the end of each month for July through December, (Assume that bad debts are written off in the third month following the sale rather than through an allowance for doubtful accounts at the time the sale is made.)

10. It is January and the XYZ Company wishes to prepare monthly cash forecast over the next four months. Sales for December were ₹ 11, 00,000. Expected sales for the next four months are:

Month	January	February	March	April
Expected sales	₹6,00,000	₹8,00,000	₹11,00,000	₹8,00,000

(a) Thirty percent of the firm's sales are for cash; the remainder is collected in the month following the sale (there are no bad debts). Disbursements consist of payments for raw materials, direct labour, other operating expenses, purchases of fixed assets, and taxes. Costs of sales are 75 percent of sales. Of these costs of sales, 38 percent are raw material costs and 62 percent are direct labour costs. Direct labour costs are paid in the month incurred, while raw materials are purchased on net 30-day terms. Other operating expenses total ₹ 1, 50,000 per month. Expenditures for fixed assets of ₹ 75, 000 are to be made in February and April and tax payments of ₹ 1, 10,000 are to be made in January and March. As of January 1, there are no surpluses or deficits and the firm's cash balance is ₹ 83, 000. The firm keeps a cash balance equal to 10 percent of the month's cost of sales. Generate monthly cash forecast for the upcoming four months.

Answers: Self Assessment

1. Government Bonds
2. Long-range forecasts
3. Daily cash
4. Spot Method
5. Proportion of another Account
6. Compounded Growth
7. Forecasters
8. shorter
9. Sales uncertainty
10. True
11. False
12. False

9.11 Further Readings

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Notes

Unit 10: Receivable Management

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the objectives of trade credit
- Discuss the credit policies
- Identify the dimensions of receivable management
- Describe the collections from receivables

Introduction

Account Receivables occupy an important position in the structure of current assets of a firm. They are the outcome of rapid growth of credit sales granted by the firms to their customers. Credit sales are reflected in the value of Sundry Debtors [SD's in India]. It is also known as Trade Debtors (TDs), Accounts Receivable (BR's) on the asset side of balance sheet. Trade credit is most prominent force of modern business. It is considered as a marketing tool acting as a bridge between production and Sales to customers. Firm grants credit to protect its sales from the competitors and attract the potential customers. It is not possible to increase the sales without credit facility and increase in sales also increases profits. But investment on accounts receivables involves certain costs and risks. Therefore, a great deal of attention is normally paid to the effective and efficient management of accounts receivable.

Did u know? **What is the meaning of accounts receivables?**

The term receivable is defined as "debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business". When the firm sells it products services on credit, and it does not receive cash for it immediately, but would be collected in near future. Till collection they form as current assets.

Notes

10.1 Objectives of Trade Credit

Trade credit exists when one firm provides goods or services to a customer with an agreement to bill them later, or receive a shipment or service from a supplier under an agreement to pay them later. It can be viewed as an essential element of capitalization in an operating business because it can reduce the required capital investment to operate the business if it is managed properly.

1. ***To reduce capital requirements:*** If a firm has trade credit arrangements with its suppliers, it'll obviously require less capital to operate the business. It can make payments to its suppliers within the decided credit term, upon receipt of payment from its customers. Thus, the business will continue to operate with lower capital requirements. Additionally, firms can then effectively leverage the capital towards activities such as acquiring new customers, enter newer markets, engage in product research to produce better products, etc.
2. ***To improve cash flows:*** Simply defined, cash flow is the amount of money coming into a business in comparison with the amount of money going out. A positive cash flow (i.e. amount of money coming in greater than that going out) enables a smoother business operation. With trade credit, businesses can buy now and pay later – thus postponing the amount of money going out. Payments can be deferred as defined in the credit term and can be made on receipt from customers.
3. ***To help increase business focus:*** With a trade credit agreement in place with suppliers, businesses can look to grow without the burden of immediate payments setting them back. Business growth requires investment – growth could be hampered if most of a business' capital is spent in making payments. As mentioned in the paragraph above, with trade credit, businesses can focus on activities like sales and marketing, research and new product development to further acquire new customers and enter new markets.

Notes Trade credit creates a win-win proposition for both – buyers and suppliers. While buyers have the advantages as accruing from the points discussed above, suppliers also have assured buyers for their products.

Self Assessment

Fill in the blanks:

1. ..... exists when one firm provides goods or services to a customer with an agreement to bill them later.
2. If a firm has trade credit arrangements with its suppliers, it'll require ..... capital to operate the business.

10.2 Credit Policies

A firm's credit policy is regarding its credit standards, credit period, cash discounts, and collection procedures.

10.2.1 Types of Credit Policy

The credit policy may be:

1. Lenient or
2. Stringent (tight)

Notes

Lenient Credit Policy

It is that policy where the seller sells goods on very liberal credit terms and standards. In other words, goods are sold to the customers whose creditworthiness is not up to the standards or whose financial position is doubtful.

Advantages of Lenient Credit Policy

1. ***Increase in Sales:*** Lenient credit policy expands sales because of the liberal credit terms and favorable incentives granted to customers.
2. ***Higher Profits:*** Increase in sales leads to increase in profits, because higher level of production and sales reduces permit cost.

Disadvantages of Lenient Credit Policy

1. ***Bad Debt Loss:*** A firm that follows lenient credit policy may suffer from bad debts losses that arise due to the non-payment credit sales.
2. ***Liquidity Problem:*** Lenient credit policy not only increases bad debt losses but also creates liquidity problem because when the firm is not able to receive the payment at a due date, it may became difficult to pay currently maturing obligations.

Caselet

Subprime Lending in USA

After the global recession, we all know that a sub-prime loan in US meant the loans that the banks created to offer people that otherwise would not be able to qualify for a regular fixed mortgage loan. Since there were a lot of people that fell under that category, the banks saw a great scope of making good money from such people when they repaid. In 2000, the Federal Reserve lowered the interest rates to avoid the country from going into a recession. This caused the economy to expand and housing prices to go up. The lowering of interest rates hit 1%. The banks now armed with these new sub-prime loans needed home buyers and that too in good numbers. Consequently, the banks and mortgage lenders started issuing sub-prime loans to everyone and many requirements to obtain these loans were no longer need to qualify (like income statements, tax returns, etc). As a result, the borrower who already was below the creditworthy standard had to go deeper in debt and default while repayment.

This lenient credit policy of these banks and mortgage lenders put US and later on nearly the whole world in a financial crisis.

Stringent Credit Policy

Stringent credit policy seller sells goods on credit on a highly selective basis only i.e., the customers who have proven credit worthiness and financially sound.

Advantages of Stringent Credit Policy

1. ***Less Bad Losses:*** A firm that adopts stringent credit policy will have minimum bad debts losses, because it had granted credit only the customers who are creditworthy.

Notes

2. ***Sound Liquidity Position:*** The firm that follows stringent credit policy will have sound liquidity position, due to the receipt of all payments from customers on due date, the firm can easily pay the currently maturing obligations.

Disadvantages of Stringent Credit Policy

1. ***Less Sales:*** Stringent credit policy restricts sales, because it is not extending credit to average credit worthiness customers.
2. ***Less Profits:*** Less sales automatically reduces profits, because firm may not be able to produce goods economically, and it may not be able to use resource efficiently that leads increase in production cost per unit.

10.2.2 Credit Policy Variables

As we have seen in the credit policy that majority of firms follow a credit policy is one, which maximizes firm's operating profit. For establishing optimum credit policy, the financial manager must consider the important decision variables, which have bearing on the level of receivables. In other words, the credit policy variables have bearing on level of sales, bad debts loss, discounts taken by customers, and the collection expenses. The major credit policy variable includes the following:

1. Credit Standards,
2. Credit Terms, and
3. Collection Policy and Procedures.

1. ***Credit Standards:*** Firm has to select some customers for extension of credit. For this firm has to evaluate the customer. In evaluation of customers what standards should be applied? Credit stands refer to the minimum criteria for the extension of credit to a customer. Credit ratings, credit references, average payment periods. And certain financial ratios provide a quantitative basis for establishing and enforcing credit standards. The firm's decision, to accept or reject a customer, and to extend credit depends on credit standards. Firms may have more number of standards in this respect, but at one point it may decide not extend credit to any customer, even though his/her credit rating is strong. On the other point, firm may decide to provide goods on credit to all customers irrespective of their credit creditworthiness. Practical ones lie between these two points.
2. ***Credit Terms:*** The second decision criteria in receivables management are the credit terms. Credit terms mean the stipulations under which goods or services are sold on credit. Once the credit terms have been established and the credit worthiness of the customers has been assessed, the financial managers have to decide the terms and conditions on which credit is extended to customer and the discount, if any, given for early payment. Credit terms have three components such as:

   (a) *Credit Period:* The period of time, for which credit is allowed to a customer to economic value of purchases. It is generally expressed in terms of a net data. If a firm's credit terms are not 60, it is understandable that payment will be made within 60 days from the date to credit sales. Generally the credit period is decided with the consideration of industry norms and depending on the firm's ability to manage receivables. A decision regarding lengthening of credit period increases sales by increases sales by inducing existing customers to purchase more and attracting new customers. But it also increases investment in receivables and lowers the quality of

Notes

trade credit. In other words, it increases investment in receivables and bad debt loss. On the other hand, shortening of the credit period (existing) will lead to lower sales, decrease investment in debtors, and reduce the bad debt loss. A firm should finalize the decision relating to credit period [either lengthening or shortening credit period] only after cost, benefit analysis. If the change in net profit is positive, it is better to go for credit period and vice versa.

(b) *Cash Discount:* The second part of credit terms is cash discount. Cash discount represents a percent reduction in sales or purchase price allowed for early payment of invoices. It is an incentive for credit customers to pay invoices in a timely fashion. In other words, it encourages the customers to pay credit obligations within a specified period of time, which will be less than the normal credit period. It is generally stated, as percentage of sales. Cash discount terms specify, the repayment terms required of all credit customers, which involve rate of cash discount.

Example: '2/20 net 60', which means creditor (sells) grants 2 per cent discount, if debtor (buyer) pays his/her accounts with 20 days after beginning of the credit period.

Financial managers before going to offer cash discount, he/she is suppose to estimate the change in net profit, it is positive, then he can go for providing cash discount and vice versa.

(c) *Cash Discount Period:* It refers to the duration in which the discount can be availed from collection of receivable and is influenced by the cash discount period. Extension of cash discount period may prompt some more customer to avail discount and more payments, which will release additional funds. But extension of cash discount period will result in late collection of funds, because the customers who are able to pay will have less cash discount thus now they may delay their payments. It will increase collection period of the firm. Hence, financial manager has to match the effect on collection period of the firm. Hence, financial manager has to match the effect on collection period with the increased cost associated with additional customers availing the discount.

3. ***Collection Policy:*** This is the third aspect in receivables management. The collection of a firm is the procedures passed to collect amount receivables, when they become due. It is needed because all customers do not say the bill receivables in time collection procedures includes monitoring the state of receivables, dispatch of letters to customers whose due date is approaching, electronic and telephonic advice to customers around the due date, thereat of legal action to overdue customers, and legal action against overdue accounts. Customers may be divided into two categories such as slow payer and non-payers. Hence, there is a need for accelerating collections from slow payers and reduce bad debt losses. Collection policies may be divided in to two categories:

   (a) Strict/rigorous, and

   (b) Lenient/lax collection policy.

   Adoption of strict collection policy tends to decrease sales, reduces average collection period, bad debt percentage, and increases the collection expenses. On the other hand, lenient collection policy will increase sales average collection period, bad debt losses, and reduce collection expenses. Financial manager has to see the benefits and costs from adopting one credit policy, if the change in net profit is positive, he/she has to go with new credit policy and vice versa.

Notes

Self Assessment

Fill in the blanks:

3. ..... is the amount of money coming into a business in comparison with the amount of money going out.
4. Firms grant credit to ..... its sales from the competitors and ..... the potential customers.
5. ..... is the rate of return earned on a security if it is held till maturity.
6. A ..... cash flow enables a smoother business operation.
7. ..... is the purchase of accounts receivables at a discount.

10.3 Dimensions of Receivable Management

The important dimensions of receivables management are:

1. Credit policy,
2. Credit evaluation, and
3. Credit control.

Let us go through each of them one by one.

1. ***Credit policy:*** A firm requires a suitable and effective credit policy to control the level of total investment in receivables. As already discussed, the credit policy may be defined as setting the principles that govern the extent of credit and the terms to be extended to the customers. They require credit standards i.e. the conditions that are required for granting credit. In other words, who can give credit and to what extent the credit terms, the period of credit and the rate of cash discount to be allowed for early payment.
2. ***Credit Evaluation:*** Proper evaluation of the credit worthiness of the customer is an important element of credit management. In assessing credit risks two types of error may occur:

   Type 1: Classifying a good customer as less credit worthy.

   Type 2: Classifying a bad customer as a creditworthy customer.

   Type 1 error leads to loss of profit on sales to a good customer who is denied credit. Type 2 error may result in bad debts loss or heavy collection costs on account of extending credit to an unworthy customer. To reduce the risk of both types of errors evaluation of the applicant's credit standing is important.

   The credit evaluation involves three steps:

   (a) Obtaining credit information,

   (b) Analyzing information obtained, and

   (c) Taking a decision regarding the amount of credit to be given and the period of credit.

Task Discuss what activities you would precisely undertake under each of the step of the evaluation process if you are to make the credit evaluation for your organization.

Notes

3. ***Credit control:*** Once the credit policy is formulated and credit extended to different customers, it is necessary to control the receivables. Control can be exercised in two directions

   (a) Collection procedures

   (b) Monitoring receivables.

Case Study

The O2I Difference

Outsource2india (O2I) is wholly owned by Flatworld Solutions Pvt. Ltd. which is located and headquartered in Bangalore, India. The parent company first started serving the global market in 1999. At the beginning it offered just custom software development. But soon the company began offering a wide range of specialized business process outsourcing solutions designed to meet rapidly increasing market demands. Today, Flatworld Solutions is an independent company that has over 600 people in multiple delivery centers spread across India, South East Asia and South America.

O2I was initially approached by an urgent care practice in Maryland to take care of Account Receivables Management. The client was also facing a problem on the billing side like:

1. The billing was not completed within 24 hours
2. Steep Decrease in collections
3. Poor quality of work done by in-house billers

The Client wanted to hand over the billing side to O2I in 2 months if he got satisfied with the company's ability on the AR Management. O2I did a good job and the owner of the clinic handed over the billing part as promised.

For successful ARM, O2I had to use a new software namely AdvancedMD for carrying out the operations. The personnel got cross-trained over phone on the practice management software.

The Project involved O2I

1. To provide Full Service Billing.
2. To handle average of 700 claims every month

To which the company took the following measures to improve collections and productivity:

1. A dedicated Account Manager and Team were deputed to handle the clients account
2. The team consisted of full time employees for medical billing, medical coding and an AR expert
3. Evolved a medical billing process and an AR process to make sure that billing took place within 24 hours
4. Follow-up on denied claims
5. Address issues with insurance company and get them resolved
6. Maintain knowledge base of issues and solutions

Contd...

Notes

As a result, the Maryland clinic was able to:

1. Witness that the average AR days were brought down from 34 to 23 days within 6 months
2. Witness that the collection percentage increased from 53% to 61% within 6 months
3. Have significant improvement in the cash flow as a result of increase in collection ratios
4. Concentrate on patient care and see more patients, with the availability of more time, and a clutter free office
5. Decrease reliance on employees and eliminate fluctuations associated with backlogged claims and employee turnover
6. Increase operating efficiency and reduce administrative costs

Questions

1. What do you think as the best step to have been taken by O2I in order to make the project successful?
2. Do you think that outsourcing the accounts receivable management is better than doing it by oneself? Why/ why not?

Source: www.outsource2india.com

Self Assessment

Fill in the blanks:

8. Trade credit creates a ..... proposition for both – buyers and suppliers.
9. An ..... is the money owed to a company by a consumer for products and services purchased on credit.
10. Accounts receivable management's main goal is to take care of all the ..... and to record .....
11. A factor evaluates the customer's .....

10.4 Collections from Receivables

Just evaluation of individual accounts does not help in efficient accounts receivables management without continuous monitoring and control of receivables. In other words, success of collection effort depends on monitoring and controlling receivables. Then how to monitor and control receivables? There are traditional techniques available for monitoring accounts receivables. They are:

1. Receivables turnover,
2. Average Collection period,
3. Aging Schedule, and
4. Collection Matrix.

Notes

1. ***Receivable Turnover:*** Receivables turnover provides relationship between credit sales and debtors (receivables) of a firm. It indicates how quickly receivables or debtors are converted into cash. Ramamurthy observes "collection of debtors is the concluding stage for process of sales transaction". The liquidity of receivables is therefore, is measured through the receivables (debtors) turnover rate.

   Debtors or Receivable Turnover Rate = Credit Sales ÷ Average Debtors or receivables

   Caution Debtors' turnover rate is expressed in terms of times. Analyst may not be able to access credit sales information, average debtors and bills receivables.

   To avoid of non-availability of the above information and to evaluate receivables turnover there is another method available for analyst.

   Debtors or Receivables Turnover Rate = Total Net Sales ÷ Average Debtors

2. ***Average Collection Period (ACP):*** Turnover rate converted into average collection period is a significant measure of how long it takes from the time sales is made to the time to cash is collected from the customers.

   ACP = 365 ÷ Debtors or Receivables turnover

3. ***Aging Schedule:*** As we have seen in the above average collection period measures quality of receivables in an aggregate manner, which is the limitation of ACP. This can be overcome by preparing aging schedule. Aging schedule is a statement that shows age wise grouping of debtors. In other words, it breaks down debtors according to the length of time for which they have been outstanding.

   Example: A hypothetical aging schedule is as follows:

Age Group (in days)	Amount Outstanding (₹)	Percentage of Debtors to total Debtors
Less than	40,00,000	40
31–45	20,00,000	20
46–60	30,00,000	30
Above 60	10,00,000	10
Total	1,00,00,000	100

   Aging schedule is helpful for identifying slow pay debtors, with which firm may have to encounter a stringent collection policy. The actual aging schedule of the firm is compared with industry standard aging schedule or with bench mark aging schedule for deciding whether the debtors are in control or not.

4. ***Collection Matrix:*** Traditional methods (debtors' turnover rate, average collection period) of receivables management are very popular, but they have limitations, that they are on aggregate data and fail to relate the outstanding accounts receivables of a period with credit sales of the same period. The problem of aggregating data can be eliminated by preparing and analyzing collection matrix. Collection matrix is a method (statement) showing percentage of receivables collected during the month of sales and subsequent months. It helps in studying the efficiency of collections whether they are improving or deteriorating.

Notes

Example: Following table shows hypothetical collection matrix.

Percentage of receivables collected during the	April	May	June	July	August
Sales (₹ Lakh)	350	340	320	300	250
Month of Sales	10	12	14	11	08
First month following	30	38	40	30	34
Second month following	25	24	22	20	21
Third month following	20	26	22	19	18
Fourth month following	15	10	02	15	20
Fifth month following	-	-	-	05	09

From the above table, it may be read for April sales are ₹ 350 lakh. The patterns of collections are 10 per cent in the same month (April), 30 per cent of sales in May, 25 per cent of sales in June, 20 per cent of sales in July and the remaining 15 per cent in the August.

Self Assessment

Fill in the blanks:

12. Administrative costs to the business are ..... as all collections activity is undertaken by the factoring company.
13. Collection matrix helps in studying the ..... of collections.
14. Aging schedule is helpful for identifying ..... debtors.
15. Receivables turnover provides relationship between ..... and ..... of a firm.

10.5 Summary

- Account Receivables occupy an important position in the structure of current assets of a firm.
- They are the outcome of rapid growth of credit sales granted by the firms to their customers.
- Credit sales are reflected in the value of Sundry Debtors.
- It is also known as Trade Debtors (TD's), Accounts Receivable (BR's) on the asset side of balance sheet.
- Trade credit is most prominent force of modern business.
- It is considered as a marketing tool acting as a bridge between production and Sales to customers.
- Firm grants credit to protect its sales from the competitors and attract the potential customers.
- It is not possible to increase sales without credit facility, increase in sales also increases profits.
- But investment on accounts receivables involves certain costs and risks.
- Therefore, a great deal of attention is normally paid to the effective and efficient management of accounts receivable.

Notes

10.6 Keywords

Lenient Credit Policy: It is that policy where the seller sells goods on very liberal credit terms and standards.

Receivable: The term receivable is defined as "debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business".

Receivable Turnover: Receivables turnover provides relationship between credit sales and debtors (receivables) of a firm.

Stringent Credit Policy: Stringent credit policy seller sells goods on credit on a highly selective basis only i.e., the customers who have proven credit worthiness and financially sound.

Time Value: A Diagram specifying the timing of cash flows.

Trade credit: Trade credit exists when one firm provides goods or services to a customer with an agreement to bill them later, or receive a shipment or service from a supplier under an agreement to pay them later.

Yield to Maturity: The rate of return earned on a security if it is held till maturity.

10.7 Review Questions

1. Dream Well Company's present annual sales are ₹ 5,00,000, cost of capital is 15% and the company is in the 40% tax bracket. Company categorized its customers into four categories, viz., C1, C2, C3 and C4 (C1 customer have the highest credit standing and those in C4 have lowest credit standing). At present Company has provided unlimited credit to categories C1 and C2, where as limited credit facility to Category C3 and no credit to Category C4, since their credit standing (rating) is very low. Due to the present credit standards the company foregoing sales to the extent of ₹ 50,000 to the customers in category C3 and ₹ 40,000 to the C4 category customers. To grab the foregoing sales to the C3 and C4 category customers, company is considering to relax, credit standards, under that category C3 customers would be provided unlimited credit facility and customers in C4 category would be provided limited credit facility. As a result of relaxation in credit standards the sales are expected to increase by ₹ 75,000 and it involves 12 per cent bad debt loss on increased sales. The estimated contribution margin ration is 25 per cent and average collection period if 50 days.

   Determine the change in net profit and suggest whether the company consider the relaxation of credit standards or not.

2. As a finance manager, how would you know that you organization needs receivables management?
3. Critically analyse the traditional techniques available for monitoring accounts receivables.
4. Trade credit is most prominent force of modern business. Comment.
5. Critically examine factoring in accounts receivables management.
6. Factoring is a method of financing available to organizations that are considered as high risk. Why so?
7. What can be the different ways in which the accounts receivable management specialists can help an organization?
8. Will there be any situation in which, you would not suggest the involvement of a factor in ARM? If yes, elucidate. If no, why doesn't every company rush to a factor for its ARM?

Notes

9. By the help of a suitable example, examine the significance of collection matrix.
10. What would be the risk involved in type 1 error in ARM?

Answers: Self Assessment

1.	Trade credit	2.	less
3.	Cash flow	4.	protect, attract
5.	Yield to Maturity	6.	positive
7.	Factoring	8.	winning
9.	account receivable	10.	debts, sales of accounts
11.	credit worthiness	12.	reduced
13.	efficiency	14.	slow pay
15.	credit sales, debtors		

10.8 Further Readings

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Notes

Unit 11: Factoring

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the meaning of factoring
- Discuss the features of factoring
- Explain the role of factoring in receivables management

Introduction

Receivables constitute a significant portion of current assets of firm. But, for investment in receivables, a firm has to incur certain costs such as costs of financing receivables and costs of collection from receivables. Further, there is a risk of bad debts also. It is, therefore, very essential to have a proper control and management of receivables. In fact, maintaining of receivables poses two types of problems;

(i) the problem of raising funds to finance the receivables, and

(ii) the problems relating to collection, delays and defaults of the receivables.

A small firm may handle the problem of receivables management of its own, but it may not be possible for a large firm to do so efficiently as it may be exposed to the risk of more and more bad debts. In such a case, a firm may avail the services of specialised institutions engaged in receivables management, called factoring firms.

At the instance of RBI a Committee headed by Shri C. S. Kalyan Sundaram went into the aspects of factoring services in India in 1988, which formed the basis for introduction of factoring services in India. SBI established, in 1991, a subsidiary-SBI Factors Limited with an authorized capital of ₹ 25 crore to undertake factoring services covering the western zone

11.1 Meaning of Factoring

Factoring may broadly be defined as the relationship, created an agreement, between the seller of goods/services and a financial institution called the factor, whereby the later purchases the receivables of the former and also controls and administers the receivables of the former.

Notes

Factoring may also be defined as a continuous relationship between financial institution (the factor) and a business concern selling goods and/or providing service (the client) to a trade customer on an open account basis, whereby the factor purchases the client's book debts (account receivables) with or without recourse to the client - thereby controlling the credit extended to the customer and also undertaking to administer the sales ledgers relevant to the transaction.

The term "factoring" has been defined in various countries in different ways due to non-availability of any uniform codified law. The study group appointed by International Institute for the Unification of Private Law (UNIDROIT), Rome during 1988 recommended, in simple words, the definition of factoring as under:

"Factoring means and arrangement between a factor and his client which includes at least two of the following services to be provided by the factor:

- Finance
- Maintenance of accounts
- Collection of debts
- Protection against credit risks".

The above definition, however, applies only to factoring in relation to supply of goods and services in respect of the following:

1. To trade or professional debtors
2. Across national boundaries
3. When notice of assignment has been given to the debtors.

The development of factoring concept in various developed countries of the world has led to some consensus towards defining the term. Factoring can broadly be defined as an arrangement in which receivables arising out of sale of goods/services are sold to the "factor" as a result of which the title to the goods/services represented by the said receivables passes on to the factor. Hence the factor becomes responsible for all credit control, sales accounting and debt collection from the buyer(s).

Banks have been given more freedom of borrowing and lending both internally and externally, and facilitated the free functioning of the banks in lending and investment operations. From 1994 banks are allowed to enter directly leasing, hire purchasing and factoring services, instead through their subsidiaries. In other words, Banks are free to enter or exit in any field depending on their profitability, but subject to some RBI guidelines.

Banks provide working capital finance through financing receivables. A "Factor" is a financial institution, which renders services relating to the management and financing of sundry debtors that arises from credit sales. Factoring is a popular mechanism of managing, financing and collecting receivables in developed countries like USA and UK, and it has spread over to a number of countries in recent past including India. In India, factoring service started in April 1994, after setting up of subsidiaries. It is yet at the formative stage. In India, there are only four public sector banks that offer factoring related service in the respective regions of the country (authorized by RBI) viz., State Bank of India {subsidiary State Bank of India Factoring and Commercial Services Limited), Canara Bank (Canara Bank Factoring Limited), Allahabad Bank and Punjab National Bank to cater to the needs of the Western, Southern, Eastern and Northern regions, respectively.

Factoring is a financial service designed to help firms to arrange their receivable better. Under a typical factoring arrangement a factor collects the accounts on due dates, effects payments to the firm on these dates and also assumes the credit risks associated with the collection of the accounts.

Notes

Advantages

The following advantages relating to the facility of factor:

1. Factor ensures certain pattern of cash-in-flows from credit sales.
2. Elimination of debt collection department, if it is continuous goes factoring.

Limitations

Apart from the services observe by factor, the arrangement suffers from some limitations:

1. Services would be provided on selective accounts basis and not for all accounts (debts).
2. The cost of factoring is higher and compared to other sources of short-term working capital finance.
3. Factoring of debt may be perceived as an indication of financial weakness.
4. Reduces future sales due to strict collection policy of factor.

Self Assessment

Fill in the blanks:

1. ……..may broadly be defined as the relationship, created an agreement, between the seller of goods/services and a financial institution called the factor
2. Banks provide working capital finance through financing ……

11.2 Features of Factoring

The following are the salient features of the factoring arrangement:

1. Factor selects the accounts of the receivables of his client and set up a credit limit, for each account of receivables depending on safety, financial stability and credit worthiness.
2. The factor takes the responsibility for collecting the accounts receivables selected by it.
3. Factor advances money to the client against selected accounts that may be not-yet collected and not-yet-due debts. Generally the amount of money as advances to 70 per cent to 80 per cent of the amount of the bills (debt). But factor charges interest on advances, that usually is equal to or slight higher than the landing rate of commercial banks.

Did u know? **What is difference between factoring and a bank loan?**

Factoring differs from a bank loan in three main ways.

1. The emphasis is on the value of the receivables (essentially a financial asset), not the firm's credit worthiness.
2. Factoring is not a loan – it is the purchase of a financial asset (the receivable).
3. A bank loan involves two parties whereas factoring involves three.

The use of factoring to obtain the cash needed to accommodate the firm's immediate cash needs will allow the firm to maintain a smaller ongoing cash balance. By reducing the size of its cash balances, more money is made available for investment in the firm's growth. A company sells its invoices at a discount to their face value when it calculates that it will be better off using the

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proceeds to bolster its own growth than it would be by effectively functioning as its "customer's bank." Accordingly, factoring occurs when the rate of return on the proceeds invested in production exceed the costs associated with factoring the receivables. Therefore, the trade off between the return the firm earns on investment in production and the cost of utilizing a factor is crucial in determining both the extent factoring is used and the quantity of cash the firm holds on hand.

Many businesses have cash flow that varies. A business might have a relatively large cash flow in one period, and might have a relatively small cash flow in another period. Because of this, firms find it necessary to both maintain a cash balance on hand, and to use such methods as Factoring, in order to enable them to cover their short-term cash needs in those periods in which these needs exceed the cash flow. Each business must then decide how much it wants to depend on factoring to cover short falls in cash, and how large a cash balance it wants to maintain in order to ensure it has enough cash on hand during periods of low cash flow.

Generally, the variability in the cash flow will determine the size of the cash balance a business will tend to hold as well as the extent it may have to depend on such financial mechanisms as factoring.

Case Study

Yahoo. Products Limited

Yahoo. Products Limited manufactures a special variety of industrial which are used by other manufacturing units to produce shoes and chappals. The market for the company's product comprises a few large public limited companies and a number of small units run as proprietary or partnership concerns. The sales had in the past proved to be seasonal, with peak sales being recorded in the period January to July (year).

One year back, the company had expanded its production capacity form 4,000 to 9,000 MT per annum. However, the actual production in the financial year just ended was restricted to 6,000 MT, mainly on account of lack of orders. The cost statement for the year indicated the following:

₹/MT	
Raw Materials (V)	2,500
Direct Labour and Supervision (F)	800
Indirect Materials, Fuel, etc. (F)	500
Depreciation, Insurance, etc. (F)	2,700
Factory Cost of Production	6,500
Administration, Selling and Interest Charges (F)	500
Selling Price per MT	7,000
(exclusive of all discounts, allowance for freight, etc.)	------

Dr. Bhatt the Director was not satisfied by the under utilization of installed capacity and its effect on the profitability of the company. He called his senior managers to discuss the situation and means of improving the profitability of the concern. The Sales Manager, on whom the pressure was tried to described the limitation of sales to be the stringent credit policy pursued by the company. He argued that under the strict norms for grant of credit followed by the company, only the larger public limited companies among the customers were on the approved credit list of the company and the smaller customers were put on the cash and carry list. This, he maintained, led to overdependence on the larger customers and an almost complete neglect of a section of the market consisting of the small

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manufacturers, who were cultivated by the competition by offering them attractive discounts. In fact, the smaller manufacturers came to his company, only if, the market was starved of the product. The Sales Manager pleaded for a more liberal credit policy which would also help increase the sales volume. He ruled out the possibility of procuring additional volume of business from the big customers who had already evolved a scheme sharing out their business among the different suppliers. Any attempt to obtain more business by offering discounts to the bigger firms, the sales manager argued, will only lead to a retaliatory action by competitors and ultimately escalate into a price war which will only prove disastrous for the company. On the other hand, granting credit to the smaller customer will bring the company's policy in line with competitors and will actually stimulate growth in the consuming industry with beneficial effects to the company.

Dr. Bhatt obviously undecided about the wisdom of extending credit to the smaller customers to boost sales volume, called for a detailed note from both the Sales Manager and the Credit Manager. He, However, pointed out that any such change of credit policy, even if approved, would bring in results only in long run while there was an immediate need to boost sales. The Sales Manager, at this point, conveyed to Dr. Bhatt, an offer he had just received from the Shoe Manager. An offer he had just received from the Shoe Plast Limited, one of the larger public limited company. The controller referred to the substantial investment in receivables that this transaction would entail and reckoning interest at 18 percent per annum which was the rate the company was paying to its bankers; he argued that this transaction would involve an interest burden of ₹ 1,64,250 whereas the profits from the transaction would only be ₹ 90,000. As such the offer was wholly unattractive. Shoe Plast Limited would pay for these additional supplies to be effected in the next three months, in the seventh month from date. It was, however, unwilling to pay an interest on the extended credit term. The Sales Manager pointed out that Shoe Plast Limited ranked high in the ratings by the Credit Department and therefore, there should be no hesitation in accepting this offer for additional business.

The customer company wads carrying out an expansion scheme at that time using partly its current resources to finance the same and was, therefore, finding itself in a difficult liquid situation. It, however, expected this to be only temporary and anticipated that the position would improve considerably after six months. Shoe Plast Limited had made an offer to take 100 MT additional each month in the next three months over and above the regular offtake, if Plastic Products Limited agreed to give special credit terms. The Credit Manager, intervening at this stage, pointed to the high rate of mortality among the smaller firms. He read out a long list of the smaller firms in the industry which had closed their creditors in the last few years. He points out with pride the excellent record of the company in the matter of credit management and to the fact that the company has had no incidence of bad debts in the last smaller manufacturers. He further argued that the company would be taking grave risk if it chose to adopt such a policy, as it would lead to bad debts. About 6 per cent each year, which he was quick to point out, was about the profit margin company appears to have from its products.

Questions

1. What consideration he should take into account, while revising the credit policy of a company?
2. Advice Dr. Bhatt how he should deal with the circumstances.
3. Define factoring. Briefly discuss the services provided by a factor.
4. What are the various types of factoring?

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5. Distinguish between factoring and bill financing.
6. Briefly discuss the appraisal technique followed by a factor.
7. What are the benefits, limitations and constraints of factoring in India?
8. Write a short note on international factoring.

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books

Self Assessment

Fill in the blanks:

3. Generally the amount of money as advances to ……of the amount of the bills (debt).
4. By reducing the size of its……., more money is made available for investment in the firm's growth.
5. The …….in the cash flow will determine the size of the cash balance a business.

11.3 Role of Factoring in Receivables Management

The credit management normally gives rise to two difficult problems:

1. Problem of raising funds to finance and receivables, and
2. Problems relating to collection defaults and delays.

Particularly in case of firms having large number of customers buying on credit, lot of time and efforts are to be spent on receivables management. In such cases, the firm can assign its credit management and collection to specialized organizations called factoring organizations. These agencies manage, finance and collect the receivables of the firms. They are called factoring organizations, which are very popular in advanced countries like USA and U.K.

Factoring is the purchase of accounts receivables at a discount in order that the supplier/creditor can receive their cash straight away. A business will consider factoring receivables when facing a period of cash flow problems.

The factor purchases the client's debtors and in relation thereto, controls the credit extended to the customer and administers the sales ledger. The agreement between the firm and factor specifies the factoring procedure. Usually, the firm sends the customer's order to the factor for evaluation purpose. The factor evaluates the customer's credit worthiness and if satisfies, agrees to buy the receivables. After receiving the approval, the firm sells the goods to the customer. The customer is informed that his account is sold to the factor and instructs him to pay the dues. When receivables are sold to a factor any bad debts loss should be protected by the factor.

Factoring plays a very important role in receivables management since:

1. Factoring is one of the quickest way to produce a cash inflow into a business.
2. Administrative costs to the business are reduced as all collections activity is undertaken by the factoring company.
3. Time costs are reduced in sales transaction and invoice processing. The invoice is produced, factored and filed. All other activities are carried out by the factoring company.
4. The business no longer carries the risk of bad debts and defaulting debtors. The factoring company carries this burden.

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5. The company does not have to fall out with any customers over unpaid bills! As far as the company is concerned, they have been paid. (It is worth noting that a future invoice may not be considered for factoring if a debtor defaults).
6. Having access to the factoring company for credit checking of customers enables the supplying company to make good credit decisions on more customers.
7. Factoring does not create any balance sheet liabilities so it does not offend investors and other business stakeholders.
8. It is an inexpensive way of providing working capital to the business without high interest rates being charged.
9. Many businesses who are unable to raise finance in the normal manner, because of poor credit history, can still raise money through factoring schemes as the credit rating that matters is that of their customers.
10. Factoring is a method of financing available to organizations that are considered as high risk.

Self Assessment

State whether the following statements are true or false:

6. The factor purchases the client's debtors and in relation thereto, controls the credit extended to the customer and administers the sales ledger.
7. Factoring does not create any balance sheet liabilities so it does not offend investors and other business stakeholders.
8. Factoring is a method of financing available to organizations that are considered as low risk.

11.4 Summary

- Factoring can broadly be defined as an arrangement in which receivables arising out of sale of goods/services are sold to the "factor" as a result of which the title to the goods/services represented by the said receivables passes on to the factor.
- Factor selects the accounts of the receivables of his client and set up a credit limit, for each account of receivables depending on safety, financial stability and credit worthiness.
- Factoring is the purchase of accounts receivables at a discount in order that the supplier/creditor can receive their cash straight away. A business will consider factoring receivables when facing a period of cash flow problems.

11.5 Keywords

Factoring: Factoring may broadly be defined as the relationship, created an agreement, between the seller of goods/services and a financial institution called the factor, whereby the later purchases the receivables of the former and also controls and administers the receivables of the former.

UNIDROIT: International Institute for the Unification of Private Law

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11.6 Review Questions

1. What is factoring?
2. Write down the advantages and disadvantages of factoring.
3. What are the salient features of the factoring arrangement?
4. Briefly explain the role of factoring in receivables management.

Answers: Self Assessment

1.	Factoring	2.	receivables
3.	70 % to 80 %	4.	cash balances
5.	variability	6.	true
7.	true	8.	false

11.7 Further Readings

Books

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http://www.makati.us/factoringsbf_benefits

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Unit 12: Inventory Management

CONTENTS

Objectives

After studying this unit, you will be able to:

- Identify the tools and techniques of inventory management
- Discuss the inventory control models
- Explain the valuation of inventories
- Discuss the inventory management and cash flow timeline

Introduction

Inventory management is concerned with keeping enough product on hand to avoid running out while at the same time maintaining a small enough inventory balance to allow for a reasonable return on investment. Proper inventory management is important to the financial health of the corporation; being out of stock forces customers to turn to competitors or results in a loss of sales. Excessive level of inventory, however, results in large inventory carrying costs, including the cost of the capital tied up in inventory warehouse fees, insurance etc.

Caution A major problem with managing inventory is that the demand for a corporation's product is to a degree uncertain. The supply of the raw materials used in its production process is also somewhat uncertain. In addition, the corporation's own production contains some degree of uncertainty due to possible equipment breakdowns and labour difficulties. Because of these possibilities, inventory acts as a shock absorber between product demand and product supply.

If product demand is greater than expected, inventory can be depleted without losing sales until production can be stepped up enough to select the unexpected demand. However, inventory is difficult to manage because it crosses so many lines of responsibility. The purchasing manager is responsible for uninterrupted production and wants to have enough raw materials and work-in process inventory on hand to avoid disruption in the production process. The marketing

manager is responsible for selling the product and wants to minimize the chances of running out of inventory. The financial manager is concerned about achieving an appropriate overall rate of return. Funds invested in inventory are idle and do not earn a return.

Notes Poor inventory management results in an illiquid corporation – one that must the turnover of the inventory releases cash in a timely manner, and this cash flow is then used to make payment on payables as they come due.

12.1 Tools and Techniques of Inventory Management

The responsibility for inventory management is not wholly assignable to any one group of people, any one department or any one function. In plants with a store department or section, the inventory management function is more or less centralized. But the constant flow of material into stores and then into production and out again making inventory management a joint responsibility of many departments. Purchasing naturally has a vested interest in inventories, even to the extent that the purchasing and stores functions are often combined. Production could look after work in progress, no other arrangement would be satisfactory. Quality control is concerned with the condition of incoming materials, since all purchased items must meet quality specifications. Where there are much sections, traffic and receiving play an important inventory control role. The economic importance of inventories causes more than a passing interest on the part of accounting and finance. The fact that parts and materials must be moved from one plant location to another to be properly utilized brings in the material handling function into play, both to exercise control and to physically move parts and material.

With so many people from so many different plants areas exercising direct and indirect control over inventories, it is essential that the right hand always know that the left hand is doing. This requires continuous communication, which, in turn, requires standard procedures forms and other management devices. All these are essential to inventory management. These problems are eased somewhat in plants that use data processing systems inventory accounting but they are not eliminated. The complexity of any inventory management system is directly proportional to the number of items carried in stock and the number of interdepartmental transactions necessary to keep track of material movement and disposition.

Did u know? **What is ultimate goal of an inventory management programme?**

The ultimate goal of an inventory management programme is to provide maximum customer service at a minimum cost.

For determining material requirements, the methods used are:

Explosion Process

In many manufacturing organizations, production requirements are based directly on the sales forecast. For each of its products, the company prepares a bill of materials – a list of the parts needed for various products. To determine overall material requirements, each sub-assembly or part on the bill of materials is extended or multiplied by the planned number of finished products. This yields the total requirement for each time listed.

The explosion process is greatly simplified if electronics data-processing equipment is available. After the production level is set, cards are punched to initiate a manufacturing order for each product. It is possible to obtain, in very short-order, cards representing each part or sub-assembly

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necessary to complete the order. These requirements can then be extended mechanically to find the amount of each material or item needed to fill the overall requirement.

Past-usage Methods

The other method used for determining production requirements relies on past usage, rather than on the sales forecast. If a certain item, was used at a rate of 100 units per month during the past year – or during some other representative period – it is likely to be used at the same rate in future. If the production rate is expected to be higher or lower than in the past period, the past usage figure may be altered accordingly by an application of a factor that represents the anticipated percentage of change.

In general, the past-usage method is not as accurate as the explosion method. Changes in product mix or product design may adversely affect the results of the past usage method. In addition, it does not sufficient account of shifting production levels.

Value-volume Analysis

Many firms use the value-volume analysis to determine which inventory accounts should be controlled by the explosion method and which should be controlled by the past-usage method. In value-volume analysis the number of each item used in the past year is multiplied by its unit to find the find the annual activity for the item. In most cases, the volume analysis reveals that a relatively small percentage of the items in inventory accounts for a large percentage of annual activity. Typically, most of the cost of inventory is concentrated in a few high activity inventory accounts.

This is an important concept, because those items with a high level of activity must be more closely controlled than the ones with relatively low activity levels. Their requirements must be determined by the more accurate explosion process while requirements for the low activity items can be determined by the less accurate and less costly past-usage method. The high activity items are generally few in number but they represent most of the activity; they are the ones, therefore, that most directly affect inventory values. These items should be ordered and to increase the turnover rate. Since expediting expense, if necessary, is usually justified, lead times should be controlled by the most effective recording systems.

ABC Approach

One of the most widely recognized concepts of inventory management is refereed to as ABC inventory control. The traditional allocation of large indirect and overhead costs became less accurate as the difference in the consumption of resources by products and services increased. The ABC approach rather than allocating costs to individual units, identifies the activities that consume resources, matching costs to the level of such activities. The central aspect of the approach is the model development that to represent the logical and quantifiable relationship between the utilization of resources, the performance of activities, and the products or services they provide.

Previously, the companies could afford to make mistakes since their global profitability would hide the impact of the incorrect cost allocations. But under the current business scenario, the margin of error is much slimmer, making the knowledge of the real cost of the product and the costs of serving specific channels and customer to be the key company survival.

Example: An item having inventory cost of ₹ 10,000 has a much greater potential for saving of expenses related to maintaining inventories than an item, into these classes "A", "B"

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and "C" according to the potential amount to be controlled. When item have been classified, appropriate control techniques are develop classified, appropriate control techniques are developed for each class of inventory. "A" items justify the use of piece control techniques, where "C" items should be controlled by mean of general control techniques.

The primary criterion for classifying items into "A" and "C" categories is the annual rupees usage of each item. This is accomplished by multiplying the annual unit usage of each inventories item by its unit cost and then listing all items in descending order according to annual rupees usage. This listing should also include C column to show the cumulative annual rupees usage. Such a listing reflects the distribution of annual rupees usage.

A typical distribution in a manufacturing operation shows that the top 15% of the line items, in terms of annual rupees usage, represent 80% of the total annual rupees usages and are designated as "B" items. The "C' items represent the remaining 70 percent of the items in inventory and account for only 5% of the total rupees usage. In some cases the ABC classification will be developed independently for different types of inventory such as finished goods, raw materials and service parts.

In addition to annual rupees usage, several other factors need to be considered in developing criteria for analyzing items into "A", "B" and "C" categories. In this regard, a 'truth table can be used to facilitate the classification process. A typical "truth table" is shown below. The question included in such a table, and the parameter associated with the questions, will vary according to the specific inventory being analysed.

Table 12.1: "Truth" Table for ABC Classification

Questions	Yes Answer	Part numbers				
		1	2	3	4	5
1. Is annual usage more than ₹ 10,000?	A	1	0	0	0	0
2. Is annual usage between ₹1,000 and 10,000?	B	0	1	0	0	0
3. Is annual usage less than ₹1,000?	C	0	0	1	1	1
4. Is the unit cost over ₹ 100?	B	1	0	0	0	0
5. Does the physical nature of the item cause special storage problems?						
6. Would a stock out result in excessive costs?	B	0	0	0	0	1
	B	0	0	0	1	0

Classification

In this table six questions are asked regarding each inventoried item. A "yes" answer is indicated by a one in the appropriate column under the part number; a "no" answer is reflected by a zero. The column next to the question provides the question provides the key to the classification by indicating the inventory class associated with a "yes" answer to each question. When there is more than one "yes" answer per item, the highest classification and inventoried sub-assemblies are found in the "A" category. Small metal stamping with moderate usage are frequently "B" items, "C" items are typically hardware items such as small nuts, bolts, and screws.

ABC inventory classification and related control techniques were developed originally for mutual systems prior to the widespread use of automated inventory record keeping. ABC control placed emphasis on reducing record-keeping requirements, redirecting clerical and review effort, and implementing stratified or varying inventory control techniques. These concepts also are generally applicable to automated systems. They can be used in structuring exception reports, determining safety stocks, cycling counting programmes and in numerous other aspects of inventory management and control.

Notes

Besides the ABC there are number of other classification emphasizing on particular aspects. These are:

HML Classification

The HML (High, Medium, Low) classification is similar to ABC classification, but in this case instead of the assumption value of item, the unit value of the item is considered. The cut off points will depend on the individual units.

Example: Kerosene would be a low value item for a jeweler and a high-value item for a small shopkeeper.

The focus here is directed to control the purchase prices.

XYZ Classification

While the ABC classification has the value of the basic, the XYZ classification has the value of inventory stored as the basis of differentiation. This study is usually undertaken once a year during the annual stock checking exercises. X items are those whose inventory values are high while Z items are those whose values are low. This classification, therefore, helps in identifying the items which are being extensively stocked. If the management is not alert, one can accept C items to be in the X category. Therefore, the XYZ and ABC classification are used in conjunctions and controls can be affected on the items according to whether they are AX, BY, CZ and so on.

Task By the help of example discussed in ABC classification, construct another example to illustrate XYZ classification.

VED Classification

The VED (Vital, Essential, Desirable) classification is applicable largely to spare parts. Stocking of space parts is based on strategies different from those of raw materials because their consumption pattern in different. While consumption of raw material depends directly on the market demand for spare for spares follow the Poisson distribution and therefore, spares are classified as vital, essential and desirable. This implies that vital classes of spares have to be stocked adequately and so on. Also ABC and VED classifications can be combined to advantage. A combination of XYZ and VED methods can give an idea of what are the items that can be disposed off to train the inventory.

FSN Classification

Movement analysis forms the basis for FSN (Fast moving, Slow moving and Non-moving) classification and the items are classified according to their assumption pattern. If there is a paid change in technology, this classification will have to be up dated more often. FSN analysis is specially useful to combat obsolete items. Cut-off points in the previous few years.

SDF and GOLF Classifications

It should not be overlooked that inventory levels also dependent on the source a scare item with a long lead time will have a higher safety stock for the same consumption level. The SDF (Scarce, Difficult, Easy to obtain) classification and the GOLF (Government, Ordinary, Local, Foreign

sources) classification are systems where classification is done on the basis of general availability and the source of suppliers.

SOS Classification

Raw materials specially agriculture inputs are generally classified by the SOS (Seasonal, Off-seasonal) system since the season would generally be lower.

Other management devices are discussed as follows:

1. ***Control Account:*** The control account is maintained in the general ledger by accounting. All material purchases are charged against and all insurance are credited to it. The balance of the control account should always equal the sum of the balances of stores forms.

   The control account is frequently maintained by a purchased card system, cards are maintained for every transaction that affects the inventory receipts, insurances and adjustments. The cards are then collected by part number and the information on each card is mechanically transferred to ledger sheets.

2. ***Physical Counting:*** All companies take a periodic inventory at least one each year. Physical counting of stock on hand necessary for tax and cost accounting functions and as a means of verifying the balances showed on perpetual inventory records and in the control account maintained by accounting. Physical inventories may be taken periodically (usually annually), continuously or by sampling.

3. ***Visual Review:*** A highly subjective method of determining when to recorder is a visual reviews of stock in the old time general store, the owner would inspect his inventory and determine what should be ordered. This techniques still has limited application where the cost of the inventory is low and the cost of control needed to be minimised control is based upon the judgment of the individual ordering and periodic review of the item being ordered.

4. ***Two-bin-system:*** As the name implies, the two-bin system divides each item of inventory into two groups or bins. In the first, a sufficient supply is kept to meet current demand over a designed period of time, in the second, enough additional items are available to meet the demand during the load time necessary to fill the order.

   The advantages of this form of inventory management and control are minimum control expenses and positive physical recognition of reorder points. The principal disadvantages are the limited information available regarding inventory status of items, lack of monthly usage dates and reliance on storeroom personnel.

5. ***Minimum-maximum System:*** The minimum-maximum (min-max) system is frequently used in connection with manual inventory control systems. The minimum quantity is established in the same way as any reorder point. The maximum is the minimum quantity plus the optimum order lot size. In practice, a requisition is initiated when a withdrawal reduces the inventory below the minimum level. The order quantity is the maximum minus the inventory status after the withdrawal. If the final withdrawal reduces the stock level substantially below the minimum level, the order quantity will be larger than the calculated optimum order lot quantity.

   The effectiveness of min-max system is determined by the method and precision with which the minimum and maximum parameters are established. If these parameters are based upon arbitrary judgements with a limited factual basis, the system will be limited in its effectiveness. If the minimums are based on an objective rational basis, the system can be very effective.

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Example: Determine reorder level, minimum level, maximum level, and average stock level.

Normal usage – 100 units per week; Lead-time – 4 to 6 weeks

Minimum usage – 50 units per week; Maximum usage – 150 per week

Reorder quantity – 600 units

Solution: Reorder Level = Maximum usage × Maximum delivery time

= 150 units × 6 weeks = 900 units

Minimum Level = Reorder level – (Normal Usage × Average delivery time)

= 900 units – (100 units × 5 weeks) = 400 units

Maximum Level = Reorder level + Reorder quantity – (Minimum usage × Minimum delivery time)

= 900 units + 600 units – (50 units x 4 weeks) = 1,300 units

Average Stock Level = Minimum level + (Reorder quantity ÷ 2)

= 400 units + (600 units ÷ 2)

= 700 units.

6. ***Periodic Order System:*** Under the periodic order system, the stock levels for all inventory accounts are reviewed at established intervals, and orders are placed to bring all accounts up to their maximum levels. The length of review period often varies for different accounts and for different classes of items, thereby permitting higher or lower turnover rates as required. Since, orders are automatically placed, at the end of the review periods, the system greatly simplifies the ordering process. The advantage may, however, sometimes be a disadvantage because of the heavy paperwork burden it places periodically on the purchasing department.

Case Study

Nordstrom's Perpetual Inventory System

Nordstrom had its origins in a small shoe store 'Wallin & Nordstrom' (US) that began operations in 1901 in Seattle (US). The store was set up by Sweden's John W. Nordstrom and his friend Carl Wallin from Alaska. The duo had met in the late 1890s while trying to strike it rich in the Alaskan gold rush. Later on, they decided to enter into a partnership to put to use the money they made in Alaska. Since Carl Wallin was experienced in the business of shoes (he owned a shoe repair shop), they decided to open a shoe store.

Due to the duo's focus on offering quality, value-for-money merchandise and superior customer service, business flourished despite stiff competition from other local players. As the money poured in, the partners kept moving the store to bigger and better locations. The second Wallin & Nordstrom store was opened in 1923. In 1928, John W. Nordstrom handed over his stake in the business to his sons Elmer and Everett. The following year, Carl Wallin too sold his stake in the business to them. In 1933, John W. Nordstrom's third son, Lloyd, joined Elmer and Everett. The second generation Nordstrom's decided to expand the selection of shoes sold in a major way by adding many new styles, sizes, colors and brands.

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Over the next three decades, the business survived the Great Economic Depression and the Second World War, growing at a slow, but healthy pace. By the beginning of the 1960s, the number of stores had increased to eight, spread across Washington and Oregon.

Having made its mark in the country's shoe retailing landscape, the company began looking for avenues to grow further. A decision was taken to enter the promising apparel business and in 1963, Nordstrom purchased a clothing store, Best Apparel. This store was refurbished and reopened in February 1965. To reflect the change in its business model (from selling only shoes to selling apparel as well), the company renamed the stores 'Nordstrom Best' in 1966. In the same year, it began offering men's suits, sportswear and children's clothes as well. By 1968, two more stores were added under the Nordstrom Best label, bringing the total to a dozen. Nordstrom was generating $57 million every year in sales by then.

In the early 1990s, the third generation of Nordstroms was ready to retire, but they did not feel that the fourth generation (most of them aged below 30) was quite ready to take over the company's reins. In a major departure from company norms, a few outsiders (not belonging to the Nordstrom family) were brought in to handle the business as Co-Presidents. Bruce Nordstrom remained Chairman along with the other two Nordstroms, John and Jim.

Meanwhile, the company got entangled in a series of controversies due to its strained relationships with employee unions. The problems did not end here. In the highly competitive US retailing industry, efficient supply chain management practices are not considered just a tool for deriving competitive advantage. Rather, putting in place a structure to manage the entire supply chain as effectively as possible is seen as a key for survival itself.

Since margins happen to be low for any typical retailer, cost control is considered another crucial issue. As costs related to the management of inventories are in the hands of the retailer to a large extent, inventory management has emerged as one of the key attributes that help derive a competitive advantage in the industry.

Nordstrom made its first move towards modernizing its inventory management practices in the form of a new Windows NT based inventory management system, launched in November 1993. It was a very basic initiative that offered information to buyers as to the items that were to be stocked. Since all the stores were networked using this solution, sellers could find out the exact position of a particular item across the Nordstrom system. The effects of this initiative were felt within a year. The company reported an increase in net earnings from $141 million for the financial year 1994 to $202 million for 1995.

While this could be attributed to the overall improvement in the US economy, company sources agreed that the new system had played a major role in increasing the sales. Nordstrom's CFO, John Goesling said, "It is too early to measure the full impact of the system, but we like what we have seen thus far. We are going to continue to invest in merchandising information systems." Industry observers felt that Nordstrom had still not done enough to sustain this performance in the long run. As compared to the industry norms, its inventory management practices left a lot to be desired.

As a result, Blake Nordstrom withdrew the 'Reinvent Yourself' campaign and made large-scale changes in the top management cadre. But, like his predecessors, he realized that many of the problems could be controlled by setting right the inventory issue. Talking of how inventory management scored over the other strategic options he was pursuing to set things right, Blake Nordstrom said, "The schedule that was on the drawing boards had little chance of being successful. I did not think the timeline and resources were realistic."

Contd...

Notes

By the beginning of the 21st century, reports appeared about how Nordstrom was finally willing to speed up the implementation of a perpetual inventory system, an initiative started by Whitacre.

The implementation of the system was expected to be completed by 2002. Blake Nordstrom said, "We recognize that Nordstrom was founded on the simple idea of taking care of customers. We want to reconnect with them through improved merchandise execution. Our focus is taking appropriate steps toward implementation of a perpetual inventory system in 2002."

The above initiatives made many analysts comment that Nordstrom was all set for a revival. Therefore, the news of profits for 2001 declining by an astounding 50% over 2000 was seen as a very disturbing development. The share price had fallen from a high of $44.81 in 1999 to just $19 in mid-2001.

What was even more appalling was that Nordstrom had not fared well on what it considered to be its core competency, customer service. In 2001, Neiman Marcus was ranked the leader among all department-store chains in the US with respect to customer service.

Skeptics reportedly felt that Nordstrom was making yet another round of empty promises. Considering that it had been talking of reaping the benefits of the new inventory system for quite a few years without any result, the skepticism seemed quite logical. Under these circumstances, the company's healthy results for the second quarter of 2002 provided a long-awaited respite from a series of negative developments. Profits stood at $65.9 million as against $36.3 million for the corresponding period in the previous year.

Questions

1. What losses did Nordstrom suffer due to the inventory mismanagement?
2. What was Blake Nordstrom's most interesting move to put the company on the right path?

Source: www.icmrindia.org

Self Assessment

Fill in the blanks:

1. ABC inventory classification and related control techniques were developed originally for ..... systems prior to the widespread use of automated inventory record keeping.
2. If the inventory is purchased with cash, there is an ..... cost of the funds.
3. ..... costs constitute all the costs of holding items in inventory for a given period of time.
4. The ..... classification is applicable largely to spare parts.

12.2 Inventory Control Models

Given the significance of the benefits and costs associated with holding inventories, it is important that the firm efficiently control the level of inventory investments. A number of inventory control models are available that can help in determining the optimal inventory level of each item. These models range from the relatively simple to the extremely complex. Their degree of complexity depends primarily on the assumptions made about the demand or use for the item and the lead time required to secure additional stock.

Notes

In the "classic" inventory models, which include both the simpler deterministic models and the more complex probabilistic models, it is assumed that demand is either uniform or dispersed and independent over time. In other words, demand is assumed either to be constant or to fluctuate overtime due to random elements. These types of demand situations are common in retailing and some services operations.

The simper deterministic inventory control models, such as the Economic Order Quantity (EOQ) model, assume that both demand and lead times are constant and known with certainty. The more complex probabilistic inventory control models assume that demand, lead time, or both are random variables with known probability distributions.

Caselet

Dell's Working Capital

Dell Computer Corporation was founded in 1984 by then nineteen-year-old Michael Dell. The company designed, manufactured, sold and serviced high performance personal computers. Its Core Strategy was to Sell Directly to customers. It had a low cost sales distribution model with production cycle that began after the company received a customer's order. The Built-to-order manufacturing process yielded low finished goods inventory balances. By mid 90's finished goods inventory was as low as 10% to 20%. It had low number of suppliers which helped Dell to focus on sourcing quality components. The ware houses were located close to dell's plants which helped them maintain low level of inventory. This saved both space and capital. Supply of inventory lower than its competitors, provided Dell a competitive advantage.

Source: www.findfreeessays.com

Basic EOQ Model

Inventories serve a number of important functions such as meeting anticipated demand, smoothing production requirements, taking advantage of quantity discounts, minimizing the effects of production and delivery disruptions, and hedging against price increases. However, inventories cost money to obtain and keep around. Therefore, two simultaneous pursuits of inventory control are to provide the right material at the right time and to minimize the cost of providing that service.

The Economic Order Quantity (EOQ) is the number of units that a company should add to inventory with each order to minimize the total costs of inventory – such as holding costs, order costs, and shortage costs. The EOQ is used as part of a continuous review inventory system, in which the level of inventory is monitored at all times, and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. The EOQ provides a model for calculating the appropriate reorder point and the optimal reorder quantity to ensure the instantaneous replenishment of inventory with no shortages. It can be a valuable tool for small business owners who need to make decisions about how much inventory to keep on hand, how many items to order each time, and how often to reorder to incur the lowest possible costs.

There are several assumptions used in the derivation of the economic order quantity:

1. Knowing the ordering cost and the cost of holding inventory
2. Instant replenishment of inventory (entire shipment comes in at one time)
3. The item is not allowed to experience shortages (at least in the simple EOQ relationship)

Notes

4. Expressions for the ordering cost and the holding cost as a function of the order quantity are required
5. The average inventory level with constant demand and instantaneous replenishment will be one-half the order quantity
6. The holding cost is assumed to be directly proportional to the average inventory level
7. The ordering cost is assumed to be constant for each order
8. The demand rate is level and constant from one time period to the next
9. The number of orders per year will be the annual demand divided by the order quantity.

Annual Usage

Expressed in units, this is generally the easiest part of the equation. You simply input your forecasted annual usage.

Order Cost

Also known as purchase cost or set up cost, this is the sum of the fixed costs that are incurred each time an item is ordered. These costs are not associated with the quantity ordered but primarily with physical activities required to process the order.

For purchased items, these would include the cost to enter the purchase order and/or requisition, any approval steps, the cost to process the receipt, incoming inspection, invoice processing and vendor payment, and in some cases a portion of the inbound freight may also be included in order cost. It is important to understand that these are costs associated with the frequency of the orders and not the quantities ordered. For example, in your receiving department the time spent checking in the receipt, entering the receipt, and doing any other related paperwork would be included, while the time spent repacking materials, unloading trucks, and delivery to other departments would likely not be included. If you have inbound quality inspection where you inspect a percentage of the quantity received you would include the time to get the specs and process the paperwork and not include time spent actually inspecting, however if you inspect a fixed quantity per receipt you would then include the entire time including inspecting, repacking, etc. In the purchasing department you would include all time associated with creating the purchase order, approval steps, contacting the vendor, expediting, and reviewing order reports, you would not include time spent reviewing forecasts, sourcing, getting quotes (unless you get quotes each time you order), and setting up new items. All time spent dealing with vendor invoices would be included in order cost.

Carrying Cost

Also called Holding cost, carrying cost is the cost associated with having inventory on hand. It is primarily made up of the costs associated with the inventory investment and storage cost. For the purpose of the EOQ calculation, if the cost does not change based upon the quantity of inventory on hand it should not be included in carrying cost. In the EOQ formula, carrying cost is represented as the annual cost per average on hand inventory unit. Below are the primary components of carrying cost.

Interest: If you had to borrow money to pay for your inventory, the interest rate would be part of the carrying cost. If you did not borrow on the inventory, but have loans on other capital items, you can use the interest rate on those loans since a reduction in inventory would free up money that could be used to pay these loans. If by some miracle you are debt free you would need to determine how much you could make if the money was invested.

Notes

Insurance: Since insurance costs are directly related to the total value of the inventory, you would include this as part of carrying cost.

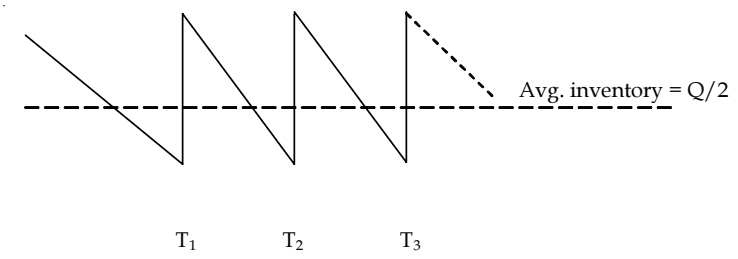
Taxes: If you are required to pay any taxes on the value of your inventory they would also be included.

Storage Costs

Mistakes in calculating storage costs are common in EOQ implementations. Generally companies take all costs associated with the warehouse and divide it by the average inventory to determine a storage cost percentage for the EOQ calculation. This tends to include costs that are not directly affected by the inventory levels and does not compensate for storage characteristics. Carrying costs for the purpose of the EOQ calculation should only include costs that are variable based upon inventory levels.

The assumption of the EOQ model yields the saw-toothed inventory pattern shown in Figure 12.1. The vertical line at the 0, T_1, T_2, and T_3 points in time represent the instantaneous replenishment of the amount of the order quantity, Q, and the negatively sloped lines between the replenishment points represent the use of the item. Because the inventory level varies between 0 and the order quantity, average inventory is equal to one-half of the order quantity, or Q/2.

Figure 12.1: Certainty Case of the Inventory Cycle



This model assumes that the costs of placing and receiving an order are the same for each order and independent of the number of units ordered. It also assumes that the annual cost of carrying 1 unit of the item in inventory is constant regardless of the inventory level. Total annual inventory cost, then, are the sum of ordering costs and carrying costs. The primary objective of the EOQ model is to find the order quantity Q that minimizes total annual inventory cost.

Algebraic Solution: In developing the algebraic form of the EOQ model, the following variables are defined

Q = The order quantity, in units

D = The annual demand for the item, in units

S = The Cost of placing and receiving an order, or set-up cost

C = The annual cost of carrying 1 unit of the item in inventory

Ordering costs are equal to the number of orders per year which is equal to annual demand, D, divided by order quantity, Q. Carrying costs are equal to average inventory, Q/2, multiplied by the annual carrying cost per unit, C.

The total annual cost equation is as follows:

Total cost = Ordering cost + Carrying cost

Notes

By substituting the variable just defined into above equation, the following expression is obtained:

Total costs = (Number of orders per year × Cost per order) + (Average inventory × Annual carrying cost per unit)

Or, in algebraic terms,

$$\text{Total cost} = (D/Q \times S) + (Q/2 \times C)$$

The EOQ is the value of Q that minimizes the total costs given in equation. The standard procedure for finding this value of Q involves calculus. The optimal solution, or EOQ, is equal to the following:

$$Q^* = 2\sqrt{SD/c}$$

Another item of information that sometimes is useful for planning purposes is the optimal length of one inventory cycle; that is, the time between placements of orders for the item. The optimal length of one inventory cycle, T*, measured in days, is equal to the economic order quantity, Q*, divided by the average daily demand, D/365 (assuming 365 days per year), as follows

$$T^* = Q^*/D/365$$

This equation can be rewritten as follows:

$$T^* = 365 \times Q^*/D$$

Example: Let us work out an example to understand the EOQ Model and on fixed order quantity policies:

A company, ABC Ltd., for one of its class 'A' items, placed 8 orders each for a lot of 150 numbers, in a year. Given that the ordering cost is ₹ 5,400.00, the inventory holding cost is 40 percent, and the cost per unit is ₹ 40.00. Find out if the company is making a loss in not using the EOQ Model for order quantity policies.

What are your recommendations for ordering the item in the future? And what should be the reorder level, if the lead time to deliver the item is 6 months?

'D'	= Annual demand	= 8 × 150 = 1200 units
'P'	= Unit purchase cost	= ₹ 40.00
'S'	= Ordering Cost	= ₹ 5400.00
'F'	= Holding Cost	= 40%

Using the Economic Order Equation:

$$Q^* = \sqrt{(2DS/H)} = \sqrt{2DS/FP} = EOQ$$

$$= \sqrt{(2*5400*1200)/(0.40*40)}$$

Minimum Total Annual Cost: TVC (Q*) = FPQ*

= 900 × 0.40 × 40

= ₹ 14,400.00

The Total Annual Cost under the present system = TVC (Q) = DS/Q + HQ/2

= ₹ (1200 × 5400/150 + 0.40 × 40 × 150/2)

Notes

= ₹ (43,800 + 1200) = ₹ 45,000.00

The loss to the company = ₹ 45,000 – ₹ 14,400 = ₹ 30,600.00

Reorder Level: R_B = L × D = (6/12) × 1200 = 600 units

The company should place orders for economic lot sizes of 900 units in each order. It should have a reorder level at 600 units.

Example: A manufacturer has to supply his customers 600 units of his product per year. Shortages are not allowed and the inventory carrying cost amounts to ₹ 0.60 per unit year. The set up cost per run is ₹ 80. Find:

(i) The Economic order Quantity.

(ii) The minimum average yearly cost.

(iii) The optimum number of orders per year.

(iv) The optimum period of supply per optimum order.

(v) The increase in the total cost associated with ordering 20 per cent more than EOQ.

Solution:

We are given:

D = Total number of unit supplied per unit time period = 600 units

A = Set up cost per run = ₹ 80

r = Inventory carrying cost per unit per year = ₹ 0.60.

(i) Economic order quantity is given by:

$Q^{EOQ} = \sqrt{(2DA/r)}$

= 400 units

(ii) Minimum average yearly cost is given by:

$T^{EOQ} = (D \times A)/Q^{EOQ} + (Q^{EOQ} \times r)/2$

= (600 × 80)/400 + (400 × 0.60)/2

= ₹ 240.

(iii) The optimum number of orders per year is:

$N^{EOQ} = D/Q^{EOQ} = 600/400 = 3/2$

(iv) The optimum period of supply per optimum order is:

$T^{EOQ} = 1/N^{EOQ} = 1/(3/2)$

= 2/3

(v) Ordering 20% higher than EOQ:

Ordering quantity = (120 × 400)/100 = 480 units

With

Q^{EOQ} = 400 and Q = 480,

The ratio $k = Q/Q^{EOQ} = 480/400 = 1.2$

Notes

We have

$T^Q/T^{EOQ} = [(1/k + k)/2]$

$= (1/1.2 + 1.2)/2$

$= 61/60$

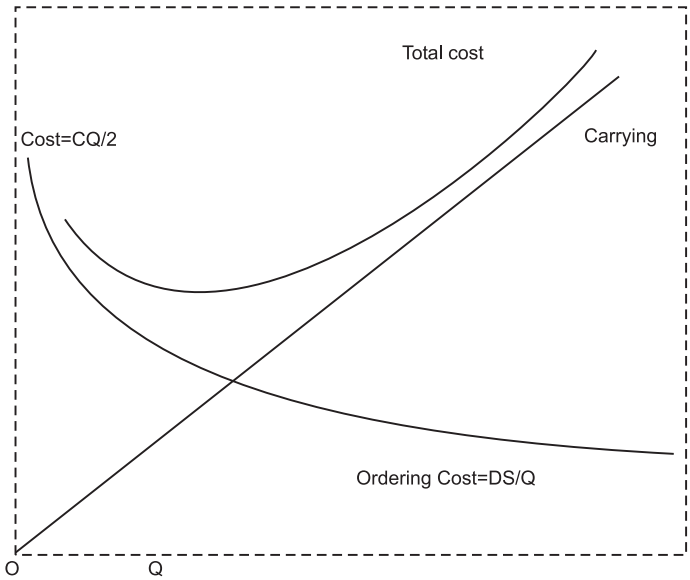
Thus the cost would increase by 1/60th

Or 240 × 1/60 = ₹ 4

Graphic Solution

The order quantity that minimizes total annual inventory costs can be determined graphically by plotting inventory costs (vertical axis) as a function of the order quantity (horizontal axis). As can be seen in the figure, annual ordering costs, DS/Q, vary inversely with the order quantity, Q, because the number of orders placed per year, D/Q, decreases as the size of the order quantity increases. Carrying costs, CQ/2, vary directly with the order quantity, Q because the average inventory, Q/2, increases as the size of the order quantity increases.

Figure 12.2: Graphic Solution of the EOQ Model



The total inventory cost curve is found by vertically summing the heights of the ordering cost and carrying cost functions. The order quantity corresponding to the lowest point on the total cost curve is the optimal solution – that is, the economic order quantity, Q*.

Extensions of the Basic EOQ Model

The basic EOQ model just described makes a number of simplifying assumptions, including those pertaining to the demand for the item, replenishment lead time, the behavior of ordering and carrying costs, and quantity discounts. In practical applications of inventory control models, however, some of these assumptions may not be valid. Thus, it is important to understand how different assumptions affect the analysis and the optimal order quantity. The following discussion examines what occurs when some of these assumptions are altered.

Notes

Non-zero Lead Time

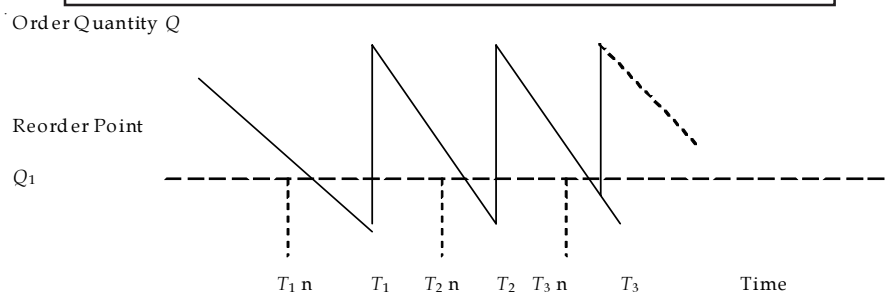
The basic EOQ model assumes that orders to replenish the inventory of an item are filled instantaneously; that is, the lead time is zero. In practice, however, some time usually elapses between when a purchase order is placed and when the item actually is received in inventory. This lead time consists of the time it takes to manufacture the item, the time it takes to package and ship the item, or both.

If the lead time is constant and known with certainty, the optimal order quantity, Q*, is not affected, although the time when an order should be placed is. Specially, a company should not wait to reorder unit the end of the inventory cycle, when the inventory level reaches zero such as at points T_1, T_2, and T_3, in Figure 12.3. Instead, it should place an order n days prior to the end of each cycle, n being equal to the replenishment lead time measured in days. The reorder point is defined as the inventory level at which an order should be placed for replenishment of an item. Assuming that demand is constant over time, the reorder point, Q_1, is equal to the lead time, n (measured in days), multiplied by daily demand:

$$Q_r = n \times D/365$$

Where D/365 is daily demand (based on 365 days per year)

Figure 12.3: Non-zero Replenishment Lead Case of an Inventory Cycle



Quantity Discounts

Large orders often permit a company to realize substantial per-unit savings (that is, economies of scale) in manufacturing, order processing, and transport. Many companies encourage their customers to place large orders by passing on to them a portion of these savings in the form of quantity discounts. With a quantity discount, the cost per unit to the customer is variable and depends on the quantity discount on the optimal order quantity.

First, the EOQ is determined, using equation next, the annual net returns when the order quantity is increased from the EOQ level up to the size necessary to receive the discount are calculated. The annual net returns are equal to the discount savings on the annual demand less any increase in annual inventory costs, as defined in equation, if the annual net returns are positive, the optimal order quantity is the order size necessary to receive the discount: if they are not, the optimal order quantity is the smaller EOQ value.

Probabilistic Inventory Control Models

So far the analysis has assumed that demand or usage is uniform throughout time and known with certainty, as well as the lead time necessary to procure additional inventory is also fixed, known value. However, in most practical inventory management problems either (or both) of

Notes

these assumptions may not be strictly correct. Typically, demand fluctuates over time due to seasonal, cyclical, and "random" influences, and imprecise forecasts of future demands often are all that can be made. Similarly, lead times are subject to uncertainty because of such factors as transportation delays, strikes, and natural disasters. Under these conditions, the possibility of stock outs exists. To minimize the possibility of stock outs and the associated stock out costs, most companies use a standard approach of adding a safety stock to their inventory. A safety stock is maintained to meet unexpectedly high demand during the lead, unanticipated delays in the lead time, or both.

Figure 12.3 shows the inventory pattern characterized by these more realistic assumptions. During the first inventory cycle (0 – T_2), an order to replenish the inventory is placed at T_1, when the inventory level reaches the predetermined order point. The order then is received at T_2. The second (T_2 – T_4) is similar to the first, except that demand exceeds the normal inventory of the item, and part of the safety stock is consumed during the lead time prior to receipt of the order at T_4. During cycle 3(T_4 – T_6), demand exceeds the normal inventory plus the safety and, as a result, a stock out occurs during the lead time prior to receipt of the order at T_6.

Determining the optimal safety stock and order quantities under these more realistic conditions is a fairly complex process. However, the factors that have to be considered in this type of analyzing can be identified briefly. All other things being equal, the optimal safety stock increases as the uncertainty associated with the demand forecasts and lead times increases. Likewise, all other things being equal, the optimal safety stock increases as the cost of stock outs increases. Determining the optimal safety stock involves balancing the expected costs of stock outs against the cost of carrying the additional inventory.

Self Assessment

Fill in the blanks:

5. Under ....., it is assumed that the stocks sold or consumed in any period are those most recently acquired or made.
6. If a quantity of goods less than the base stock is owned at the end of any period, this condition is considered .....
7. In plants with a store department or section, the inventory management function is more or less ..... .
8. A combination of ..... methods can give an idea of what are the items that can be disposed off to train the inventory.

12.3 Valuation of Inventories

Decision about the desired level of inventory is difficult to relate the goal of shareholder wealth maximization. Presumably maintenance of inadequate inventories could reduce profitability and create additional uncertainty about shareholders returns. Whether such added risk can be diversified away is open to question but some tendency to raise risk premiums contained in the cost of capital and to reduce the value of equity shares may be present. In the other direction, excessive inventory levels may reduce risk of production disruptions as well as risk premiums in the cost of capital may also raise carrying costs more than enough to offset such gains. The precise optimum point, in a valuation sense is by no means clear. However, in determining valuation method to use, consideration is given to the size and turnover of inventories, the price outlook, tax laws, and prevailing practices in the field. The financial manager's influence will be felt practically in establishing underlying policies, while the expert in the different areas play important roles in evaluating the implication different procedures from the view point of their specialties.

Notes

The evaluation of inventory is significant from the standpoint both the balance sheet and the income statement. In the former, the inventory valuation influences the current assets, the total assets, the ratio between current assets and current liabilities and the retained earnings. In the later the inventory evaluation may influence the cost of goods sold and the net profits.

Under the normal circumstances, financial statements reflecting the results of the operation of a business enterprise during a particular period are preferred on a going concern basis. Consistent with this concept of continuing operations, their will always be goods on hand available for sale. The goods owned at the end of an accounting period will seldom be exactly comparable to the goods in which the opening inventory, but the purpose of inventory will be the same; to make possible uninterrupted realization of income through sales.

Average Cost Method

The exact amount of the computed cost for an individual item is generally of little significance. In fact, in the determination of cost for inventory purpose no one prescribed procedure can be used. For determining the valuation of inventories consistency from year is of prime importance and for this using average costs rather than specifically identified costs seems to be more appropriate. The averaging process is in one sense a concept of a flow of costs, but it can also be viewed as merely a compilation of the actual cost for a group of similar items under circumstances where the amount paid for each item has no significance. The entire group of items is considered as single entity; and when particular items are separated, they are treated as merely a proportionate part of the whole.

In this method normally weighted average prices are taken, purchase of each type of material in stock are taken together and an average price completed. If the price fluctuates considerably, many calculations will be involved. It is usual to calculate a new average after each delivery. The pricing book, if issued, and the stores ledger will require frequent amendment.

Since average prices are charged and, therefore whether the charges to production represent current replacement costs depends on the turnover of the stocks. In a period of rising prices slow turnover will tend to mean that costs which are lower than present day costs will be charged. In these statements there is an over statement of profit. In appropriate circumstances the use of the average cost will have a stabilizing effect of price used for issues and therefore profits.

Computations of income which attempt to reflect the actual flow of goods are not necessarily the most meaningful to business management, investors or creditors. Each of these group is normally more concerned with what the future earning of the business enterprise will be than with the amount which could be realized from the inventory if it were liquidated completely and the activity discontinued.

Example: A new company purchases four identical units in one month.

- 1 unit purchased on the 10th of the month at a cost of ₹100
- 1 unit purchased on the 16th of the month at a cost ₹120
- 1 unit purchased on the 20th of the month at a cost of ₹130
- 1 unit purchased on the 30th of the month at a cost of ₹140

Using the average cost method, if one item were sold for ₹ 250, the cost of goods sold would be ₹ 120.25 (₹ 100 + ₹120 + ₹130 + ₹140/4), profit would be ₹120.75, and ending inventory balance would be ₹360.75 (average cost per unit ₹120.25 × 3 remaining units).

Notes

First-In First-Out (FIFO) Inventory Method

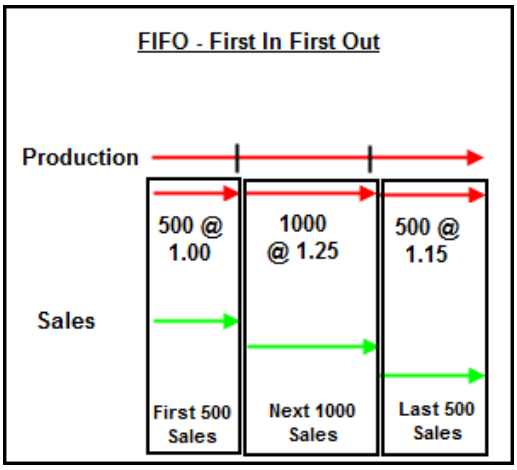
Under FIFO method, cost is computed on the assumption that goods sold or consumed are those which have been longest on hand and that those remaining the stock present the least purchases or production.

Items received first are assumed to be used first and therefore prices charged are those paid for the early purchases. Prices charged are actual prices and therefore there is no question of having to recalculate a new price each time a new purchase in received. Care has to be taken to ensure that each quantity is issued at the correct prices.

If prices are rising, costs of products will be understood and therefore profit will tend to over stand. On the other hand, stock valuations should approximate current replacement values.

Example: 1. Working on the same example as discussed in the average cost method, if one item is sold for ₹ 250 using the FIFO method, the cost of goods sold would be ₹ 100, profit would be ₹ 150 (₹250 – ₹ 100), and ending inventory balance would be ₹ 390 (₹120 + ₹ 130 + ₹ 140)

2. Now let us assume that a textile company created 500 tablecloths at a cost of $1.00 per unit and then created another 1000 with a unit cost of $1.25. The revenue from the sale of the first 500 table clothes will be matched up with the tablecloths which have a cost basis of $1.00.



Base Stock Method

Under the base stock method the minimum quantity of raw materials or other goods without which management considers the operations cannot be continued, except for limited periods. It is treated as being a fixed asset subject to constant renewal. The base quantity is carried forward at the cost of the original stock. If a quantity of goods larger than the base stock owned at the end of any period, the excess will be carried at its identified cost or at the cost determined under FIFO method. This is considered a temporary condition.

If a quantity of goods less than the base stock is owned at the end of any period, this condition is similarly considered temporary. In order not inflate the income of the period during which the base stock was deflected a reserve is set up equal to the excess of the replacement cost over the amount at which the goods would have been includes in the base stock inventory. Even if there serve for replacement is not provided for out of income of the year in which the base stock

is depleted, the originally established cost is assigned to the replacement goods in the subsequent inventories when the base stock quantities are actually on hand.

The quantity of material included in the base stock is actually a somewhat flexible minimum amount necessary to permit orderly operations within reasonable limits. The process must be able to accept goods tendered by the suppliers with whom he has continuing relations, and similarly his customer's demands must be met, not only the anticipated demands for which the customer gives order for future delivery but also the orders for immediate delivery resulting from unforeseen circumstances.

If base stock quantity is properly established, this method should result in income being fairly reflected. The cost of acquiring an equal volume of goods will be charged against revenues derived from sales. Earnings will not be affected by increases or decreases in the cost or market value of the base stock.

Income is not realized from merely replacing inventory quantities, and it can be argued that these should be deducted from the revenue derived from selling the goods previously owned whatever expenditure are necessary to restore the company to a position of being able to continue operations.

Issues are priced at actual cost but base stock is carried forward at the end of each year at the original price paid when the business commenced to operate, which may have been years ago.

Last-In First-Out (LIFO) Inventory Method

Under LIFO it is assumed that the stocks sold or consumed in any period are those most recently acquired or made. As a consequence of this assumption the stocks to be carried forwards as the inventories are considered as if they were those earliest acquired or made. The result at the LIFO method is to change current revenues with amounts approximating current replacement costs. To the goods owned at the end of any period are assigned costs applicable to items purchased or made in earlier periods.

It is more obvious with respect to LIFO to FIFO although true under both inventory methods – that the concepts are as to the flow of goods sold.

Reporting on profits by application LIFO under ideal conditions is simple. As here used, conditions are 'ideal' when closing inventory equals opening inventory and the goods sold are equivalent to the purchases for each accounting period. Since such conditions are rarely found in practice, an accounting system must be sufficiently flexible to reflect the facts, whatever they may be.

If at the end of n interim accounting period, the inventory of any LIFO group is below the opening inventory, an estimate should be charged with the cost of goods purchased plus an estimated amount to cover the cost to be incurred in making good the temporary decrease in inventory, and an account should be established for the differences between the estimated replacement cost and the LIFO inventory cost of the quantities to the interim date.

An indication of the extent to which inventory is composed of raw materials, work in process, and finished goods may be significant for balance sheet.

The artificiality of paper profits resulting from assigning a larger amount to a closing inventory merely because market prices have increased – when from the standpoint of physical attributes the opening and the closing inventories are comparable – has particular practical significance when tax rates are high only the income remaining after paying taxes can be used to replace inventories, expand the plant, pay dividends and so forth. The higher the taxes the lower is the rate of earnings, and the greater is the proportion of the year's earnings needed to maintain inventories during a period of rising prices.

Notes

Assuming no additional capital is invested for this purchase, the portion of net earnings of business needed to maintain the inventory required for continuing operations during a period of rising X costs can be expressed as a formula. If

I - Cost of inventory at the beginning of the year

T - Turnover rate for the inventory investment

R - Rate of earnings stated as the percentage which the net income after tax is of the total cost of goods for the year.

Net Earnings = (I)(T)(R)

If 'i' is the percentage increase in the replacement cost of inventory and 'e' represents the fraction of the year's earnings needed to maintain same physical volume of inventory. Then

iI = e.I.T.R

e = i/TR

Income tax rates are significant in the analysis of the consequence of increases in inventory cost because of their effect on the amount of net earnings. Every increase in income tax rate cause a reduction in the rate of earnings and results in a larger portion of the net earnings being required to maintain the inventory during a period of rising costs.

Costing an inventory by references to LIFO assumption to the flow of the costs will not alter the amount required to maintain or the intrinsic value of the inventory, but its use will tend to keep the increase in cost out of the computed income from operations. Also, any reduction in the amount of income taxes payable by a business will result in more case being available to maintain the inventory and for other needs of the enterprise.

Example: Taking the same example as in the Average Cost and FIFO method, if one item were sold for ₹ 250 using the LIFO method, the cost of goods sold would be ₹ 140, profit would be ₹ 110 (₹ 250 – ₹140), and ending inventory balance would be ₹ 350 (₹ 100 + ₹ 120 + ₹130).

Self Assessment

Fill in the blanks:

9. The ..... process is greatly simplified if electronics data-processing equipment is available.

10. Other things being equal, the optimal safety stock ..... as the cost of stock outs increases.

12.4 Inventory Management and Cash Flow Timeline

Cash Flow Timeline can be defined as a line or chart showing a company's cash inflows and cash outflows and the business activities that caused them over a given period of time.

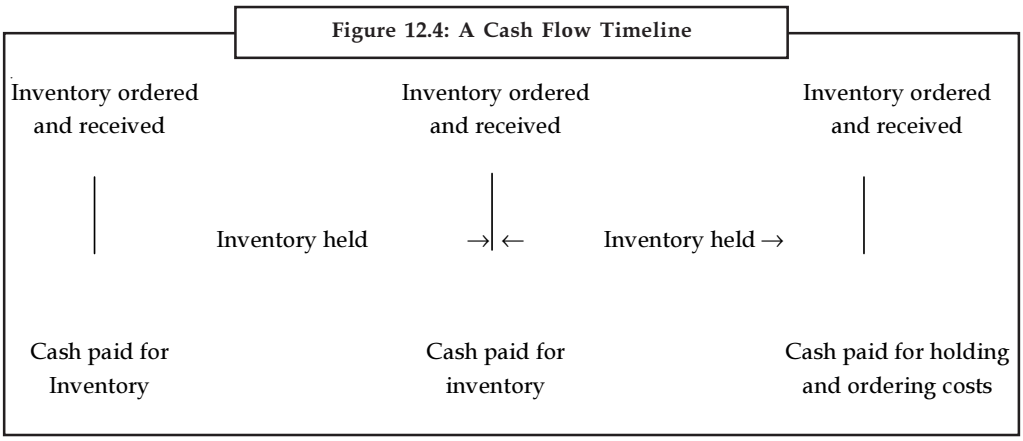
From the financial manager's point of view, inventory represents an idle investment of corporate resources. If the inventory is purchased with cash, there is an opportunity cost of the funds expended. If inventory is purchased on credit, the firm incurs additional debt and its unused borrowing capacity is diminished.

Suppose a firm requires a total of 90,000 units of inventory for a production run. Further, assume that two orders for inventory are placed for 4,000 units each. Inventory would be paid for with cash and ordering and holding costs would be paid at the end of the production run.

Notes

To depict these transactions, a cash flow timeline is shown in Figure 12.4.

Figure 12.4: A Cash Flow Timeline



Example: The financial manager of the firm wants to make certain that this inventory order quantity minimizes the present value cost of managing the inventory process while still meeting the needs of the production process. To calculate the present value of this inventory management policy, assume the following data:

Cost of capital, k = 10%

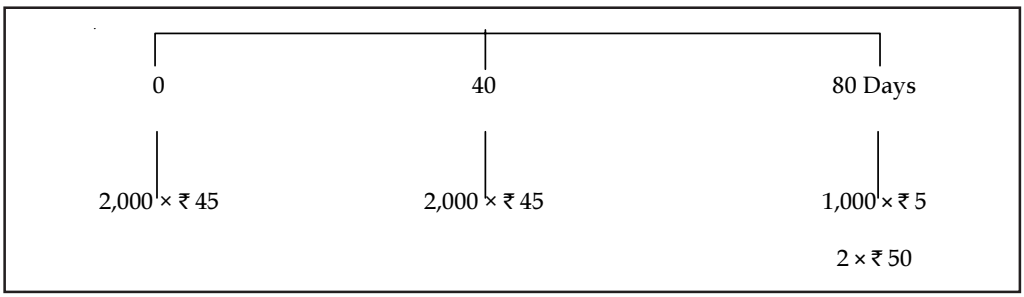
Inventory cost, I = ₹ 45 per unit

Order costs, S = ₹ 50 per order

Holding costs, C = ₹5 per average inventory unit

Further, assume that the inventory is consumed at a steady rate and the production run period is 80 days. Thus, the average daily usage rate of the inventory is 50 units per day (4,000/80). Since two orders will be placed, each for 2,000 units, and assuming that the orders are placed so that each inventory shipment arrives at the same time that the current inventory balance is used up, there are 40 days separating inventory arrivals. Therefore, the average inventory balance is 1,000 units.

Calculating the net present value cost of the current inventory policy is fairly straightforward. We will use simple interest to account for the time value of money.



PV day 0 cost = 2,000 × ₹ 45

= ₹90,000

PV day 40 cost = 2,000 × ₹ 45

= ₹ 89,024.39

Notes

PV day 80 cost = 1,000 × ₹5 + 2 × ₹50

= ₹4,990.62

Total PV cost = PV day 0 cost + PV day 40 cost + PV days 80 cost

= ₹90,000 + ₹ 89,024.39 + ₹4,990.62

Total PV cost = ₹ 1, 84,015.01

What if smallest, but more frequent, orders were placed, resulting in more payments but each of a smaller size? The financial manager would pay less money up front for inventory and, therefore, would have a smaller opportunity cost for those funds. In addition, the inventory carrying costs would decline because less inventory is held. However, order costs would inverse due to the increased number of orders placed. With the changing size and timing of the various cash flows, the only way to assess if a change in inventory policy will enhance shareholder wealth is to calculate the present value of the cash flows. The policy with the minimum present value cost should be the one that results in the greatest enhancement to shareholder wealth.

We can develop a general for formulation for the present-value timeline approach to assessing the cost of inventory management, as shown in Equation-1

$$\text{Total cost} = \frac{(S \times D/Q) + (C \times Q/2)}{1 + (i \times T)} \qquad \ldots(1)$$

Inventory Management

$$\sum_{t=0}^{(p/q)-1} \frac{Q \times 1}{1 + i \times (t \times Q \times T/D)}$$

Where D = number of inventory units required

T = number of days in the production period

Q = inventory order quantity

I = cost of each inventory unit

S = fixed order cost per order

C = holding cost per unit of inventory

i = daily opportunity cost

To understand Equation-1, first note that the first in the equation is the present value of the ordering costs, (S × D/Q), and the holding costs, (C × Q/2), that are assumed to be paid at the end or the production period. The simple-interest present-value factor is 1/(1 + (i × T). The second term is a summation of the present value of the cash flows to pay for cash inventory purchase. The cost of inventory purchase is Q × I. The present value factor accounts for the timing of cash purchase. The first purchase is at the beginning of the production period and C = 0. Thus, the simple interest faction is 1/(I + 0) or 1. This second purchase, t = 1, is on day t × Q × T/D. To understand this, first note that the daily usage rate of inventory is D/T. When Q is ordered, it takes Q divided by the daily usage rate, or [Q/(D/T)1] days, to use it up. This can be rewritten as Q × T/D. Inventory purchases are made on day t × (Q × T/D) for t = 0, 1, 2, 3, ….. (D/Q) – 1.

An example will illustrate this equation. Calling a treasurer's dilemma to find the trade-off between placing larger orders to reduce ordering costs but at increased holding and opportunity costs of the investment, we can now assess the value of the quantity discount offered through the use of the cash flow timeline formulation of the inventory decision.

Notes

Example: Assume the following value for the inventory decision variables prior to the discount offer

D = 1,000 S = ₹ 5

T = 100 C = ₹ 2.50

Q = 200 i = .15/365 = .00041

I = ₹ 10

Using these numbers yields the following values.

Total inventory loading costs = ₹50, C × (Q/2)

Total ordering costs = ₹ 25, S × (D/Q)

Cost of each purchase lot = ₹ 2,000, l × Q

	Inventory purchase day t × (Q × T/D)	PV factor I + (1 + i(t × QT/D))	PV Holding and ordering	PV Inventory Purchase
0	0	1,000		₹ 2,000
1	20	.9918		₹1,983
2	40	.9838		₹1,967
3	60	.9759		₹ 1,951
4	80	.9682		₹ 1,936
	100	.9606	₹ 264 ₹ 264	₹ 9,817

Total present value cost = ₹264 + ₹ 9,837 = ₹10,101

Now assume that the supplier is willing to discount the price per unit to ₹ 9.50 for purchase quantities of 500 units.

Total inventory holding costs = ₹ 625, C × (Q/2)

Total ordering costs = ₹10, S × (T/Q)

Cost of each purchase lot = ₹4,750 I × Q

	Inventory purchase day t × (Q × T/D)	PV factor I + (1 + i(t × QT/D))	PV Holding and ordering	PV Inventory Purchase
0	0	1,0000		₹4,750
1	50	.9799		₹ 4,654
	100	.9606	₹ 610 ₹ 610	₹ 9,404

Total present value cost = ₹609 + ₹9,404 = ₹10,014

The present value cost of the inventory can be reduced from 10,101 to ₹10,014 by taking advantage of the quantity discount. In the case, the reduced cost of the inventory more than offset the additional holding costs and the larger initial payment for the inventory lot ordered.

This approach can be used to solve for the order quantity, Q, with the least cost similar to the approach used by the quantity discount model. A simple solution is not possible, since the

Notes

present value factors for inventory costs, Q × I are functions of the quantity order, Q, which determines the timing of the purchases.

The traditional EOQ model is insensitive to the impact on present value cost of the changes in the timing of cash flows resulting from different order quantities and different payment terms. In other words, if one supplier offered a combination of quantity discounts and payment terms different from another supplier. The EOQ model would not be able to adequately assess the differences between the present value costs of the two options. Only the present value timeline approach can accurately gauge the true present value cost differences between alternative inventory ordering plans.

Self Assessment

Fill in the blanks:

11. ..... can be defined as a line or chart showing a company's cash inflows and cash outflows and the business activities that caused them over a given period of time.
12. The complexity of any inventory management system is directly proportional to the number of items carried in stock and the number of ..... transactions necessary to keep track of material movement and disposition.
13. In HML classification, the ..... value of the item is considered.
14. ..... is carried forward at the end of each year at the original price paid when the business commenced to operate.
15. The traditional EOQ model is ..... to the impact on present value cost of the changes in the timing of cash flows resulting from different order quantities and different payment terms.

12.5 Summary

- Inventory management is concerned with keeping enough product on hand to avoid running out while at the same time maintaining a small enough inventory balance to allow for a reasonable return on investment.
- A major problem with managing inventory is that the demand for a corporation's product is to a degree uncertain.
- The supply of the raw materials used in its production process is also somewhat uncertain.
- Carrying costs constitute all the costs of holding items in inventory for a given period of time.
- They are expressed either in rupees per unit per period or as a percentage of the value per period.
- ABC inventory classification and related control techniques were developed originally for mutual systems prior to the widespread use of automated inventory record keeping.
- ABC control placed emphasis on reducing record-keeping requirements, redirecting clerical and review effort, and implementing stratified or varying inventory control techniques.
- These concepts also are generally applicable to automated systems.
- Value-volume Analysis is an important concept, because those items with a high level of activity must be more closely controlled than the ones with relatively low activity levels.
- The VED (Vital, Essential, Desirable) classification is applicable largely to spare parts.

Notes

- Stocking of space parts is based on strategies different from those of raw materials because their consumption pattern in different.
- While consumption of raw material depends directly on the market demand for spare for spares follow the Poisson distribution and therefore, spares are classified as vital, essential and desirable.
- This implies that vital classes of spares have to be stocked adequately and so on.
- Also ABC and VED classifications can be combined to advantage.
- A combination of XYZ and VED methods can give an idea of what are the items that can be disposed off to train the inventory.
- The basic EOQ model assumes that orders to replenish the inventory of an item are filled instantaneously; that is, the lead time is zero. In practice, however, some time usually elapses between when a purchase order is placed and when the item actually is received in inventory.
- This lead time consists of the time it takes to manufacture the item, the time it takes to package and ship the item, or both.
- Determining the optimal safety stock and order quantities under these more realistic conditions is a fairly complex process.
- However, the factors that have to be considered in this type of analyzing can be identified briefly.
- All other things being equal, the optimal safety stock increases as the uncertainty associated with the demand forecasts and lead times increases.
- Likewise, all other things being equal, the optimal safety stock increases as the cost of stock outs increases.

12.6 Keywords

Cash Flow Timeline: A line or chart showing a company's cash inflows and cash outflows and the business activities that caused them over a given period of time.

Terminal Value: The value of an asset at some point of time in future.

Tombstone: An advertisement that announces a public offering.

12.7 Review Questions

1. Determine reorder level, minimum level, maximum level, and average stock level.

   Normal usage – 100 units per week; Lead-time – 4 to 6 weeks

   Minimum usage – 50 units per week; Maximum usage – 150 per week

   Reorder quantity – 600 units

2. A company purchases a component of a product at the rate of ₹ 50 per piece. The annual consumption of that component is 25,000 pieces. If the ordering cost is ₹230 per order and carrying cost is 20 per cent per annum, what would be the EOQ?

3. AIM Company Ltd. uses quarterly 50,000 units of raw materials. Cost of raw materials is ₹100 per unit, Cost of placing an order is ₹120 and carrying cost is 9 per cent per year. Calculate EOQ.

Notes

4. Hindustan Engineering Factory consumes 75,000 units of a component per year. The ordering, receiving and handling costs are ₹ 6 per order while transportation cost is ₹ 24 per order. Depreciation and obsolescence cost ₹ 0.008 per unit per year; interest cost ₹ 0.12 per unit per year; storage cost ₹ 2,000 per year for 75,000 units. Calculate EOQ.

5. The following information relating to inventory in WTS Ltd. is made available to you. The company wants to introduce the scheme of ordering only the economic order quantity.

   Annual demand : 480 units; Price per unit : ₹4

   Carrying cost : 40 paise per unit; Cost per order : ₹5 per unit

   Determine the economic order quantity. Also determine the number of orders per year and frequency of purchases.

6. For balance sheet, what might be the significance of the extent to which inventory is composed of raw materials, work in process, and finished goods?

7. Critically evaluate the explosion process.

8. What can be the limitations of First-in, First-out Inventory Method?

9. Is there any significance of cash flow time line in the inventory management? If yes, elucidate upon the same. If no, why are they studied in combination under inventory management?

10. Which method of inventory valuation do you think to be the best and why?

Answers: Self Assessment

1.	mutual	2.	opportunity
3.	Carrying	4.	VED (Vital, Essential, Desirable)
5.	LIFO	6.	temporary
7.	centralized	8.	XYZ and VED
9.	explosion	10.	increases
11.	Cash Flow Timeline	12.	interdepartmental
13.	unit	14.	Base stock
15.	insensitive		

12.8 Further Readings

Books

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Pandey, *Financial Management*, Vikas Annex.54.J.3 -MBA - Finance - SDE Page 20 of 23.

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Notes

Online links

wps.prenhall.com

financenmoney.wordpress.com

www.tutorsonnet.com

Notes

Unit 13: Integration of Working Capital and Capital Investment Process

CONTENTS

Objectives

After studying this unit, you will be able to:

- Know the capital investment process
- Discuss Working capital decisions vs capital investment decisions
- Identify the role of working capital in the investment process
- Explain working capital and marketable securities
- Discuss working capital and investment: The theoretical perspective

Introduction

For investment firms rely to a large extent on internal finance especially those firms for which external finance is either too expensive or just not available. By retaining cash flows, firms accumulate the financial funds needed for investment. A considerable share of the financial assets that firms hold takes the form of so called working capital, which consists of short-term assets and short term liabilities. Working capital is needed for the day-to-day financial operation of the firm and as such is an important indicator of the liquidity of the firm.

13.1 Capital Investment Process

Capital investment decisions are long-term corporate finance decisions relating to fixed assets and capital structure. Decisions are based on several interrelated criteria. Corporate management

Notes

seeks to maximize the value of the firm by investing in projects which yield a positive net present value when valued using an appropriate discount rate. These projects must also be financed appropriately. If no such opportunities exist, maximizing shareholder value dictates that management return excess cash to shareholders. Capital investment decisions thus comprise:

1. An investment decision,
2. A financing decision, and
3. A dividend decision.

13.1.1 Investment Decision

Management must allocate limited resources between competing opportunities ("projects") in a process known as capital budgeting. Making this capital allocation decision requires estimating the value of each opportunity or project: A function of the size, timing and predictability of future cash flows.

Project Valuation

In general, each project's value is estimated using a Discounted Cash Flow (DCF) valuation, and the opportunity with the highest value, as measured by the resultant Net Present Value (NPV) is selected. This requires estimating the size and timing of all of the incremental cash flows resulting from the project. These future cash flows are then discounted to determine their present value. These present values are then summed, and this sum net of the initial investment outlay is the NPV.

Did u know? **What does Discounted Cash Flow - DCF Mean?**

A valuation method used to estimate the attractiveness of an investment opportunity. Discounted cash flow (DCF) analysis uses future free cash flow projections and discounts them (most often using the weighted average cost of capital) to arrive at a present value, which is used to evaluate the potential for investment. If the value arrived at through DCF analysis is higher than the current cost of the investment, the opportunity may be a good one.

Calculated as:

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \ldots + \frac{CF_n}{(1+r)^n}$$

CF = Cash Flow

r = discount rate (WACC)

The NPV is greatly affected by the discount rate. Thus identifying the proper discount rate – the project "hurdle rate" – is critical to making the right decision. The hurdle rate is the minimum acceptable return on an investment – i.e. the project appropriate discount rate. The hurdle rate should reflect the riskiness of the investment, typically measured by volatility of cash flows, and must take into account the financing mix. Managers use models such as the Capital Asset Pricing Model (CAPM) or the Arbitrage Pricing Theory (APT) to estimate a discount rate appropriate for a particular project, and use the Weighted Average Cost of Capital (WACC) to reflect the financing mix selected.

Notes

Notes A common error in choosing a discount rate for a project is to apply a WACC that applies to the entire firm. Such an approach may not be appropriate where the risk of a particular project differs markedly from that of the firm's existing portfolio of assets.

In conjunction with NPV, there are several other measures used as (secondary) selection criteria

Example: Discounted Payback Period, IRR, Modified IRR, Equivalent Annuity, Capital Efficiency and ROI.

Valuing Flexibility

In many cases, for example R&D projects, a project may open (or close) paths of action to the company, but this reality will not typically be captured in a strict NPV approach. Management will therefore sometimes employ tools which place an explicit value on these options. So, whereas in a DCF valuation the most likely or average or scenario specific cash flows are discounted, here the "flexible and staged nature" of the investment is modelled, and hence "all" potential payoffs are considered. The difference between the two valuations is the "value of flexibility" inherent in the project.

The two most common tools are Decision Tree Analysis (DTA) and Real Options Analysis (ROA); they may often be used interchangeably:

1. DTA values flexibility by incorporating possible events or states and consequent management decisions. In the decision tree, each management decision in response to an "event" generates a "branch" or "path" which the company could follow; the probabilities of each event are determined or specified by management. Once the tree is constructed:
   (a) "all" possible events and their resultant paths are visible to management;
   (b) given this "knowledge" of the events that could follow, management chooses the actions corresponding to the highest value path probability weighted;
   (c) then, assuming rational decision making, this path is taken as representative of project value.

Example: A company would build a factory given that demand for its product exceeded a certain level during the pilot-phase, and outsource production otherwise. In turn, given further demand, it would similarly expand the factory, and maintain it otherwise.

2. ROA is usually used when the value of a project is contingent on the value of some other asset or underlying variable. Here, using financial option theory as a framework, the decision to be taken is identified as corresponding to either a call option or a put option – valuation is then via the Binomial model or, less often for this purpose. The "true" value of the project is then the NPV of the "most likely" scenario plus the option value.

Example: The viability of a mining project is contingent on the price of gold; if the price is too low, management will abandon the mining rights, if sufficiently high, management will develop the ore body.

Notes

Quantifying Uncertainty

Given the uncertainty inherent in project forecasting and valuation, analysts will wish to assess the sensitivity of project NPV to the various inputs (i.e. assumptions) to the DCF model. In a typical sensitivity analysis the analyst will vary one key factor while holding all other inputs constant, ceteris paribus. The sensitivity of NPV to a change in that factor is then observed, and is calculated as a "slope":

Δ NPV / Δ factor.

Example: The analyst will determine NPV at various growth rates in annual revenue as specified (usually at set increments, e.g. –10%, –5%, 0%, 5%....), and then determine the sensitivity using this formula.

Often, several variables may be of interest, and the various results may be combined to produce a "value-surface", where NPV is a function of several variables.

Using a related technique, analysts also run scenario based forecasts of NPV. Here, a scenario comprises a particular outcome for economy-wide, "global" factors (exchange rates, commodity prices, etc.) as well as for company-specific factors (revenue growth rates, unit costs, etc.). As an example, the analyst may specify specific growth scenarios.

Example: 5% for "Worst Case", 10% for "Likely Case" and 25% for "Best Case", where all key inputs are adjusted so as to be consistent with the growth assumptions, and calculate the NPV for each.

Note that for scenario based analysis, the various combinations of inputs must be internally consistent, whereas for the sensitivity approach these need not be so. An application of this methodology is to determine an "unbiased NPV", where management determines a (subjective) probability for each scenario – the NPV for the project is then the probability-weighted average of the various scenarios.

13.1.2 Financing Decision

Achieving the goals of corporate finance requires that any corporate investment be financed appropriately. As above, since both hurdle rate and cash flows (and hence the riskiness of the firm) will be affected, the financing mix can impact the valuation. Management must therefore identify the "optimal mix" of financing-the capital structures that result in maximum value.

The sources of financing will, generically, comprise some combination of debt and equity. Financing a project through debt results in a liability that must be serviced and hence there are cash flow implications regardless of the project's success. Equity financing is less risky in the sense of cash flow commitments, but results in a dilution of ownership and earnings. The cost of equity is also typically higher than the cost of debt, and so equity financing may result in an increased hurdle rate which may offset any reduction in cash flow risk.

Management must also attempt to match the financing mix to the asset being financed as closely as possible, in terms of both timing and cash flows.

One of the main theories of how firms make their financing decisions is the Pecking Order Theory, which suggests that firms avoid external financing while they have internal financing available and avoid new equity financing while they can engage in new debt financing at reasonably low interest rates.

Notes

Another major theory is the Trade-off Theory in which firms are assumed to trade-off the tax benefits of debt with the bankruptcy costs of debt when making their decisions.

An emerging area in finance theory is right-financing whereby investment banks and corporations can enhance investment return and company value over time by determining the right investment objectives, policy framework, institutional structure, source of financing (debt or equity) and expenditure framework within a given economy and under given market conditions.

One last theory about this decision is the Market timing hypothesis which states that firms look for the cheaper type of financing regardless of their current levels of internal resources, debt and equity.

Caselet

Aash Biotech: Intelligent Financing Decisions

Aash Biotech is an Ahmedabad, India based pharmaceutical firm that started its operations in 200 by the financing mix of Pecking order theory and right financing. From a small marketer and distributor of pharmaceutical products, the company has grown to become a progressive pharmaceutical company engaged in the development, commercialization and marketing of prescription pharmaceutical products.

At Aash, the product development has continually expanded both on existing and new product lines. The promotion is done directly through the Company's own expanding sales force in over 10 states through franchise and wholesale drug company's network. With uninterrupted growth in sales and profits, the company adopted market timing hypothesis so as to finance its new projects.

13.1.3 Dividend Decision

The dividend is calculated mainly on the basis of the company's unappropriated profit and its business prospects for the coming year. If there are no NPV positive opportunities, i.e. where returns exceed the hurdle rate, then management must return excess cash to investors. These free cash flows comprise cash remaining after all business expenses have been met.

This is the general case, however there are exceptions.

Example: Investors in a "Growth stock", expect that the company will, almost retain earnings so as to fund growth internally.

In other cases, even though an opportunity is currently NPV negative, management may consider "investment flexibility"/potential payoffs and decide to retain cash flows.

Management must also decide on the form of the distribution, generally as cash dividends or via a share buyback. There are various considerations: where shareholders pay tax on dividends, companies may elect to retain earnings, or to perform a stock buyback, in both cases increasing the value of shares outstanding; some companies will pay "dividends" from stock rather than in cash.

Example:

1. If Mr. Ramnaresh owns 1% of a firm X's common stock, and the firm follows the policy E = D + I, Ramnaresh's dividend = .01D.

Notes

Ramnaresh owns 1% of a firm X's common stock, but if the firm follows the other policy E < D + I, Ramnaresh must invest additional funds to maintain his 1% ownership in Firm X.

Now if F = the additional funding obtained by the firm E + F = D + I, then .01F is required.

This implies that the amount of the extra cash dividend is exactly offset by the amount Ramnaresh needs to spend to maintain his 1% ownership in Firm X.

But if the firm follows the policy E > D + I, Ramnaresh must sell back stock to the firm or else end up with more than 1% ownership.

Important: No matter what dividend policy the firm follows, Ramnaresh is still able to spend the same amount on consumption.

2. A condensed balance sheet for Taxes Electronic Inc. is given in table. Texas Electronics has total assets of ₹ 130 crore, of which cash is ₹ 14 crore. The firm has approximately ₹ 10 crore in excess cash that can be either paid out in dividends or used to repurchase stock. The firm's current earnings per share are ₹ 1.20. It has 11 crore shares outstanding, currently selling for ₹ 9 per share.

This firm has been advised that it can either pay a dividend of 90 paise per share to liquidate its excess cash or it can repurchase 1 crore of its outstanding shares at ₹ 9.90 a share. In either situation, Texas Electronics will reduce its cash and its common equity account by ₹ 9.9 crore.

Texas Electronics Inc.: Balance Sheet, December 31, 1999

Cash	₹ 14.0	Current liabilities	₹ 35.0
Other current assets	76.0	Long-term debt	17.0
Total current assets	90.0	Total debt	52.0
Net plant	40.0	Common equity	78.0
Total assets	₹ 130.0	Total debt and equity	₹ 130.0

Total current earnings are ₹ 1.20 × 11 = ₹ 13.2 crore and current P/E ratio is ₹ 9/₹ 1.20 = 7.5. It is assumed that the P/E ratio will remain the same after the repurchase. The effect of the repurchase on earnings per share and P/E ratio is summarised in table. Earnings per share increase to ₹ 1.32 after the repurchase. If it is assumed that the P/E ratio remains constant, the price of the stock after the repurchase will increase to ₹ 9.90 per share. As a result of the ₹ 9.9 crore cash outflow, the current ratio will decline and the leverage ratio will increase. However, these changes would also take place with 90 paise per share cash dividend.

As this example illustrates, under the repurchase plan the stockholder is left with stock worth ₹ 9.90 after the share repurchase. If the firm decides to pay a cash dividend, the stockholder has common stock worth ₹ 9.00 a share plus 90 paise per share in cash. The rupee amounts earned as dividend is taxable in the current tax year. The capital gain, provided it is sustained over time, is taxable at a lower tax rate in the year the stock is sold.

The similarity between a stock repurchase and a cash dividend is influenced by the repurchase price of ₹ 9.90. Had the repurchase price been established at a price lower than ₹ 9.90, the remaining stockholders would benefit at the expense of stockholders who sell their share to the firm. A repurchase price higher than ₹ 9.90 would benefit the selling stockholders more. In fact, it could be argued that ₹ 9.90 is the equilibrium repurchase price. Any repurchase price below the equilibrium price would not attract any sellers. Any repurchase price above the equilibrium price would attract all stockholders.

Notes

Texas Electronics Inc.: Effect of Stock Repurchase

Item	Before repurchase	After repurchase
Total current earnings	₹ 13.2 crore	₹ 13.2 crore
Shares outstanding	11.0 crore	10.3 crore
Earnings per share	₹ 1.20	₹ 1.32
Price earnings ratio	7.50	7.50
Price	₹ 9.00	₹ 9.90
Current ratio[a]	2.57	2.29
Total debt to total assets[b]	40%	43%

[a] the before ratio is 90/35 = 2.57, and the after ratio is (90-9.9)/35=2.29

[b] The before ratio is 52/130 = 40%, and the after ratio is 52/(130-9.9) = 43%

The equilibrium repurchase price is given by

Equilibrium repurchase price = current price + equivalent amount if cash dividend is paid.

For Texas Electronics, the equilibrium repurchase price is ₹ 9.00 + 0.90 or ₹ 9.90 per share.

Today, it is generally accepted that dividend policy is value neutral.

Self Assessment

Fill in the blanks:

1. ..... investment creates the need for additional investment in inventory, accounts receivable and cash.
2. Investment is the change in ..... stock during a period.
3. If all capital is circulating capital, then ..... capital built up during the previous period can be brought over into next period.
4. ..... is the rate of growth a project is expected to generate.
5. Firms that are regarded as being of both high long-term and high short-term credit quality, have ..... stocks of inventories and financial working capital.
6. By retaining ....., firms accumulate the financial funds needed for investment.

13.2 Working Capital Decisions vs Capital Investment Decisions

As we already know, working capital is the amount of capital which is readily available to an organization. That is, working capital is the difference between resources in cash or readily convertible into cash (Current Assets), and cash requirements (Current Liabilities). As a result, the decisions relating to working capital are always current, i.e. short-term decisions.

In addition to time horizon, working capital decisions differ from capital investment decisions in terms of discounting and profitability considerations; they are also "reversible" to some extent.

Working capital management decisions are therefore not taken on the same basis as long term decisions, and working capital management applies different criteria in decision making: the main considerations are:

1. Cash flow/liquidity and
2. Profitability/return on capital

Notes

Self Assessment

Fill in the blanks:

7. If cash flows are ....., short-term borrowing will occur after cash and marketable securities are reduced to their minimum.
8. If the sum of the cost are ..... than the receipts, and liquid assets are at minimum, short term borrowing will be employed.
9. In simulating financial decisions, the strategy that produces the best simulated results is not necessarily the ..... financing strategy.
10. The financial planning process is composed of many variables and occurs in an ..... and ..... environment.

13.3 Role of Working Capital in the Investment Process

For operating a firm working capital is as crucial as fixed capital. It is the net amount of short term assets – current assets minus current liabilities – of the firm which gives it some latitude at several activities For instance, by holding inventories at various stages of the production process the firm can run larger batches and is less vulnerable to strikes, and the presence of accounts receivable on the balance sheet reflects the fact that the firm is willing to sell goods to customers that are solvent but short of cash.

Working capital is a prime measure of liquidity of the firm. Current assets include financial assets such as cash money and accounts receivable but also real assets such as inventories since it is thought that they can relatively easily be converted into cash. Current liabilities consist of (accounts) payable(s) and short-term debt.

The various parts of working capital display their own patterns over the business cycle. When a firm is experiencing a negative shock to demand, its inventories of final products will generally rise. Later on, when it becomes clear that this demand shock was the beginning of a recession and the firm is in financial distress, the firm will try to shed inventories of all kinds, to collect accounts receivable, and try to postpone payments of debts. That is, as the recession gets worse, the liquidity of firms measured as working capital decreases as does the cash flow.

Example: Southeastern's sales totaled ₹ 7.8 crore in 2003. In the past, inventories had been tightly controlled and were dictated to a considerable extent by production considerations. Inventory turnover in 2003 was 6.3 times, a figure considered quite good by industry standards. However, southeastern management had become increasingly concerned over sales lost due to stockouts of finished goods inventories. At year-end 2003, total inventories were ₹ 8,00,000, of which ₹ 2,00,000 was in finished goods.

Motivated by the problem of stock-outs, management initiated a study to determine whether finished goods inventories should be increased. From historical records of orders received and filled, management estimated that at the present inventory level, lost sales due to stock-outs were running at an annual rate of ₹ 6,25,000. Since variable costs totaled about 60 per cent of sales, lost contribution amounted to about ₹ 2,50,000.

The magnitude of the lost contribution figure convinced management that further study was necessary. Lost sales were estimated at four alternative levels of finished goods inventories, each of which represented an incremental increase over current levels. The results are listed in table. The analysis showed that if finished goods inventories were increased from the current level of ₹ 2,00,000 to ₹ 2,78,000, lost sales would decline from ₹ 6,25,000 to ₹ 4,75,000 and an additional contribution of ₹ 60,000 would be realised. Similarly, the additional contribution at inventory levels B, C, and D also was determined.

Notes

Southeastern Motors Inc.: Lost Sales

(Thousands of Rupees)

Policy	Inventory level[a]	Lost sales	Lost contribution[b]	Incremental contribution
Current	200	625	250	-
A	278	475	190	60
B	414	303	121	69
C	620	153	61	60
D	868	63	25	36

[a] Finished goods inventory only.

[b] Variable costs equal 60 per cent of sales.

The next step in the analysis was to determine carrying costs at each inventory level. Carrying costs included warehousing, servicing, taxes, insurance, and record-keeping, and amounted to about 5 per cent of the value of the inventory. This figure excluded financing costs. Incremental operating profit was estimated as shown in table. By moving to level A, carrying costs would increase by ₹ 4,000. Subtracting this figure from incremental contribution ₹ 60,000 gives a pretax increase in operating profit of ₹ 56,000 after taxes.

Southeastern Motors Inc.: Incremental Operating Profit

(Thousands of Rupees)

Policy	Inventory level	Carrying cost[a]	Incremental carrying cost	Incremental contribution[b]	Incremental operation profit	
					Before Tax	After Tax[c]
Current	200	10	-	-	-	-
A	278	14	4	60	56	28
B	414	21	7	69	62	31
C	620	31	10	60	50	25
D	868	43	12	36	24	12

[a] 5 per cent of inventory level.

[b] From table.

[c] Taxes at 50 per cent.

From the data in tables discussed so far, expected return on investment was calculated as in table.

Southeastern Motors Inc.: Expected Return on Investment in Additional Inventory

Policy	Inventory level (Thousand)	Incremental investment[a] (Thousands)	Incremental operating profit, after tax[b](Thousands)	Incremental E(R) on investment after tax (Per cent)
Current	₹ 200	₹	₹	-
A	278	78	28	35.9
B	414	136	31	22.8
C	620	206	25	12.1
D	868	248	12	4.8

[a] out-of-pocket outlay.

[b] from table.

To move from the current policy to level A, Southeastern must invest an additional ₹ 78,000 in finished goods inventory.

We have identified the costs that vary and those that remain fixed as sales expand due to recovery of lost sales. The validity of the analysis depends on our ability correctly to identify fixed and variable costs in the range of sales in question.

Notes

As finished goods inventories are increased, each successive increment recaptures less lost sales and therefore less lost contribution. At levels A and B, E(R) appears to be quite attractive. Policy D, returning only 4.8 per cent after taxes, does not seem attractive. Which policy should Southeastern adopt? The answer depends on the target or required rate of return on investment in inventories.

An important feature of the analysis above is that it examines the incremental return on successive increments of inventory. To move from the current policy to level D would require a total investment of ₹ 6,68,000. This investment would generate additional operating profit of ₹ 9600, an E(R) of 14.4 per cent. However, the E(R) on the last increment, from level C to level D, is only 4.8 per cent. By looking at several increments, we can better determine the point at which marginal E(R) falls below the required rate within increments; the figures in table represent averages. The marginal E(R) on the last rupee of investment in increment B is quite a bit lower than the average E(R), 22.8 per cent, on increment B as a whole.

At the aggregate level of the manufacturing sector both in 1975 and in 1982 working capital declined sharply; some components, such as accounts receivables and inventories even fell considerably relative to sales. The decline in working capital affects investment directly since it implies a fall in internal funds, and indirectly by raising the cost of external funds.

Bernanke and Gertler (1988) and Gertler (1989) argue that the agency cost of external finance depends on the quality of the balance sheet of the firm. When its liquidity decreases or when prospects concerning future sales deteriorate, the cost of external finance rises. Eckstein and Sinai (1986) found that at the end of the recession and at the beginning of a recovery firms try to rebuild their debt capacity by accumulating short-term financial assets in order to be able to borrow at acceptable rates when they need funds for investment. According to them this re-liquefaction characterizes a separate phase of the business cycle that precedes the period in which firms start to invest again.

A firm will also reduce inventories of materials during the recession as it will produce less.

It is conceivable that firms also save working capital in order to make sure that it can carry out an investment plan that takes years without interruption due to lack of cash. Depending on the structure of the adjustment costs, working capital has still another effect on the investment process beyond those mentioned above. It will be used to smooth investments in the case of convex adjustment costs. If a fixed costs component dominates, investments decisions will seem irreversible.

As Whited (1991) points out the height of the opportunity costs of reversing the investment decision varies with the cost of external finance which in turn depends on the availability of working capital inter alia. From the irreversibility literature we know that the higher the sunk costs, the longer a firm will wait to execute its investment plan ceteris paribus. Thus the size of the stock of working capital influences the timing (delay) of investment. Notice that working capital can be used for smoothing investment because it is in contrast to physical capital perfectly reversible. The amount of working capital that firms will hold for instance in order to make sure that investment plans don't have to be interrupted depends among other things on their reputation in capital markets.

For firms that are regarded as being of both high long term and high short term credit quality, Calomiris *et al*. (1994) find that they have lower stocks of inventories and financial working capital and in addition that these stocks are less sensitive to cash flow fluctuations. The latter finding is interpreted by them as follows. Firms of higher credit quality don't need to accumulate working capital as a buffer against fluctuations in cash flow as they can easily obtain external funds at favorable terms. Furthermore they show that given a high (long term) bond rating, only firms of large size, with low earnings variance, high cash flows and/or large stocks of

Notes

liquid assets have access to the commercial paper market. The former characteristics however seem sufficient for firms to be able to issue commercial paper successfully given the fact that they have less working capital on average.

The firm controls the various components of working capital to a different extent. In general it will have more control over inventories of materials than over inventories of finished products or accounts receivable. Moreover, the bank might set a limit to short term debt or demand a minimum level of cash. As a consequence the interpretation of working capital as a measure of liquidity depends crucially on its definition. For instance high working capital defined as cash minus short-term debt, might actually be a sign of low liquidity when it reflects restrictions imposed by the bank. The empirical literature on the interaction between investment and decisions on working capital we are aware of is very limited.

Whited (1991) put the re-liquefaction theory of Eckstein and Sinai to a test. Allowing coefficients to vary over time and controlling for demand by including output, she found that lags of working capital contributed significantly to a Q regression of investment and that in accordance with the theory investment was especially sensitive to the level of working capital just after the trough of the business cycle (in 1983). Moreover when she split the sample using the criterion of whether firms have a bond rating from Moody's or not, this particular pattern in the coefficient of working capital was only found for firms of low credit quality.

Fazzari and Petersen (1994) view working capital as a use of funds which is competing with fixed investment but also as a means (source) to smooth investment such that fluctuations in cash flow will not be transmitted fully to investment. Their empirical results indicate that when in addition to cash flow, the (simultaneous) change in working capital enters a Q regression model of ordinary investment, the coefficient of cash flow rises while the sign of the coefficient of the investment in working capital is negative. This should not be interpreted as evidence that investment and the change in working capital are negatively correlated. Their findings are consistent with the following interpretation. The change in working capital takes out the transitory component of cash flow such that the permanent component remains which determines investment primarily (through the liquidity effect). In fact if a firm is liquidity constrained a positive (negative) shock to cash flow will increase (decrease) both the stock of working capital and investment. If the shock is transitory, the extent of investment smoothing determines the actual size of the change in working capital. If the shock was negative (and transitory), the firm will not reduce working capital when it has reached some minimum level necessary for operating the firm but instead reduce investment more. Whited measures working capital as current assets minus inventories, receivables and short term debt including the current portion of long term debt.

Task Analyse and explain the situation in which a firm will not reduce working capital when it has reached some minimum level necessary for operating the firm.

13.3.1 Working Capital and Marketable Securities

The securities most commonly held as part of the marketable securities portfolio are divided into two groups:

1. Governmental issues and
2. Non-governmental issues.

The short-term obligations issued by the central government and available as marketable security are treasury bills.

Notes

Did u know? **What are treasury bills?**

The securities with a maturity of between three to twelve months, at the time of issues, are called treasury bills. The sales are carried out by the RBI, on behalf of the Central Government, to raise short-term finance for the Government and observe excess liquidity in the market.

The firm can deposit its excess cash with the commercial banks for some fixed maturity. Deposit scheme are tailored suiting to the needs of the depositors. By various combinations of Demand, Term and Recurring Deposits, banks have brought spectrum of deposit schemes. Bank deposits are very popular due to their safe character. An individual depositor gets protection to the extent of ₹ 20,000 from the Deposit Insurance Corporation. Besides, the RBI also exercises a strict surveillance over the banking system which also ensures safety of deposits.

Example: A firm is currently disbursing from its concentration bank at a cost of ₹ 25 per month for account maintenance and ₹10 per cheque processed. The controlled disbursement bank will charge ₹75 per month for account maintenance and ₹15 per cheque processed. The controlled disbursement account will add 1/2-day float to the disbursements. The company issues 100 cheques of average face amount of ₹ 2,500 per day. The treasurer maintains an overnight portfolio of about ₹10,00,000, on which she currently earns about 6% per annum. She estimates that she could earn an additional 25 basis points on the investments if she could invest earlier in the day. Transfers to the controlled disbursement account could be done at a cost of ₹ 1 per transfer. Determine the annual net benefit, or cost, of using the controlled disbursement account instead of the current system.

Solution:

The net benefits consist of the float benefits plus the gain on the earlier investment less the additional costs connected with the controlled disbursing account less the transfer costs.

Float benefits are:

annual disbursement × float gain × Investment rate

(₹ 2,500 per day × 100 × 250 days) × (.5 days) × (.06/365) = ₹ 5,137

Additional investment benefits are:

Amount of the investment portfolio × Incremental rate (₹10,00,000) × (.0025) = ₹2,500.

Incremental bank charges are:

Incremental account maintenance costs + incremental per item charges

(₹ 75 – ₹ 25) × 12 + (₹ .15 × ₹ .10) × 100 × 250 = ₹1,850

Transfer costs are: ₹ 1 × 250 = ₹250.

The net benefits are:

Float benefits + Investment benefits – Additional costs – Transfer costs

₹ 5,137 + ₹2,500 – ₹1,850 – ₹250 = ₹ 5,537

Total reduced costs = ₹1 ,01 ,250 + ₹52,000 = ₹ 1,53,250

Maximum acceptable compensating balance = ₹1,53,250/0.15 = ₹10,21,666.60

Notes

Example: The XYZ Company currently makes payments by cheques. The ABC Company, a supplier, has requested that XYZ allow ABC to debit their account 10 days after the invoice date. XYZ currently pays ABC with a cheque mailed 30 days after the invoice date. It takes an average of 5 days for the cheque to the cleared through XYZ account. The average payment to ABC is ₹500. It costs XYZ an average of ₹ 10 to process the invoice through their accounts payables department and to issue a cheque. These costs would be eliminated by the proposed procedure. The opportunity costs of funds to XYZ is 10%,

(a) Should XYZ accept ABC's offer?

(b) XYZ has received a similar offer from TNK Company. Payments to TNK company average v 5,000. All other information is unchanged from the involving ABC. Should XYZ accept TNK's offer?

Solution:

(a) Under the current system XYZ loses value from its account on day 35. They also incur internal costs of ₹10. (For simplicity assume these costs are incurred on day 35 when the payment is made.) Under the proposed payment terms XYZ will lose value of ₹500 on day 10. To compare these two we take the present value (on day 10) of the payment on day 35. This is ₹5,107 (l + l × 25/365) = ₹506.53. Under the proposed payment terms they with lose value of ₹500 on day 10. Since they will be better off by ₹6.53 with the payment terms. XYZ should accept ABC's offer.

(b) The present value on day 10 for the payment to TNK under the system is ₹5,010/(1 +. 1 × 25/365) = ₹ 4,975.92. If XYZ accepts TNK's payment terms it will lose value of ₹5,000 on day 10. Since XYZ will be worse off by ₹ 24.08, it should reject TNK's offer of the new payment terms.

Example: A firm has an annual opportunity cost of 12 per cent is contemplating installation of a lock box system at an annual cost of ₹2,60,000. The system is expected to reduce mailing time by 3 days and reduce cheque clearing time by 2 days. If the firm collects ₹ 5,00,000 per day, would you recommend the system? Explain.

Solution:

Time reduction:

Mailing time - 3 days

Clearing time - 2 days

Total time reduction - 5 days Float reduction;

5 days × ₹5,00,000/day = 25,00,000 Gross annual profit of float reduction;

0.12 × ₹25,00,000 = ₹3,00,000

Since the annual earnings from the float reduction of ₹3,00,000 exceed the annual cost of ₹2,60,000, the proposed lock-box system should be implemented. It will result in a net annual savings of ₹40,000 (₹3,00,000 – ₹2,60,000 cost).

Example: The credit terms for each of three suppliers are as follows:

Supplier Credit term

XYZ 1/10 net 46 EOM

Notes

ABC 1/10 net 30 EOM

YON 1/10 net 60 EOM

(a) Determine the approximate cost of giving up the case discount from each, supplier.

Cash Management System>n.

(b) Assume that the firm needs short-term financing, recommend whether it would be better to give up the cash discount and borrow from a bank at 15 per cent annual interest. Evaluate each supplier separately, using your findings in a.

(c) What impact, if any, would the fact that the firm could stretch its accounts payable (net period) by 20 days from supplier YON have on your answer in h relative this supplier?

Solution:

(a) Approximate Cost of Saving up Cash Discount

XYZ ABC YON

(b) Recommendation

XYZ 10% cost of giving up discount < 15% interest cost from bank; therefore take discount and borrow from bank.

ABC 18% cost of giving up discount > 15% interest cost from bank; therefore take discount and borrow from bank.

YOU 18% Cost of giving up discount > 15% interest cost from bank; therefore, take discount and borrow from bank.

(c) Stretching an accounts payable for supplier YON would change the cost of giving up the cash discount to:

2% × [360/{(60 + 20) – 20}]

In this case, in view of the 15 percent interest cost from the bank, the recommended strategy in b would be to give up the discount, since the 12 per cent cost of giving up the discount would be less than the 15 per cent bank interest cost.

13.3.2 Working Capital and Investment: The Theoretical Perspective

What is investment? Strictly speaking, investment is the change in capital stock during a period. Consequently, unlike capital, investment is a flow term and not a stock term. This means that while capital is measured at a point in time, while investment can only be measured over a period of time. If we ask "what is capital right now?", we might get an answer along the lines of ₹ 10 crore. But if we ask "what is the investment right now?", this cannot be answered.

The quantity of a flow always depends on the period in consideration. Thus, we can answer "what is investment this month?" or "what is investment this year?" We can calculate the investment flow in a period as the difference between the capital stock at the end of the period and the capital stock at the beginning of the period. Thus, the investment flow at time period t can be defined as:

$$It = Kt - Kt - 1$$

where Kt is the stock of capital at the end of period t and Kt–1 is the stock of capital at the end of period t-1 (and thus at the beginning of period t).

The theory of capital is essentially different from the theory of investment.

Notes

Caution If all capital is circulating capital, so that it is completely used up within a period, then no capital built up during the previous period can be brought over into next period. In this special case, the theory of capital and the theory of investment become one and the same thing.

With fixed capital, the story is different – and more complicated as there seems to be two decisions that must be addressed: the amount of capital and the amount of investment. These are different decisions. One is about the desired level of capital stock. The other is about the desired rate of investment flow. The decisions governing one will inevitably affect the other, but it is not necessarily the case that one is reducible to the other.

There are effectively two ways of thinking about investment. At the risk of annoying some people, we shall refer to these as the "Hayekian" and "Keynesian" perspectives. The Hayekian perspective conceives of investment as the adjustment to equilibrium and thus the optimal amount of investment is effectively a decision on the optimal speed of adjustment. A firm may decide it needs a factory (the "capital stock" decision), but its decision on how fast to build it, how much to spend each month building it, etc. – effectively, the "investment" decision – is a separate consideration. Naturally, the capital decision influences the investment decision.

Example: A firm which has ₹ 10 crore of capital and decides that it needs ₹ 15 crore of capital, therefore requires investment of ₹ 5 crore. But if this adjustment can be done "instantly", then there is really no actual investment decision to speak of. We just change the capital stock automatically. The capital decision governs everything.

However, if for some reason, instant adjustment is not possible, then the investment story begins to matter. How do we distribute ₹ 5 billion adjustment in the above example? Do we invest in an even flow over time, like ₹ 1 crore this week, another ₹ 1 crore next week, and so on? Or do we invest in descending increments, e.g. invest ₹ 1 crore this week, ₹ 50 lacs next week, ₹ 30 lacs the week after that, etc. and approach the ₹ 5 crore mark asymptotically? Or should we invest in ascending increments, e.g. ₹ 10 lac this week, ₹ 50 lac next week, etc.?

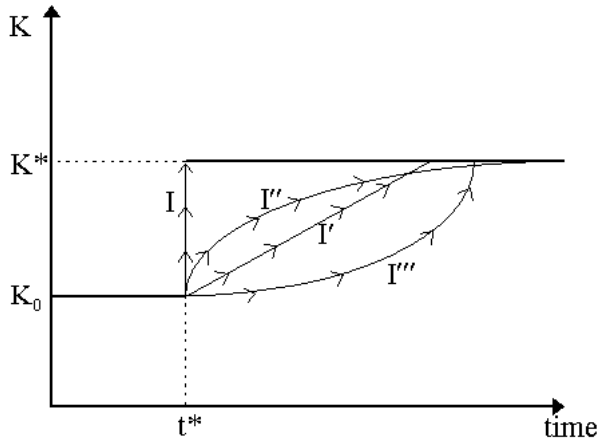
Delivery costs, changing prices of suppliers, fluctuating interest rates and financing costs, and other such considerations, make some adjustment processes more desirable than others. These different patterns of "approaching" the desired ₹ 5 crore adjustment in capital stock and the considerations that enter into determining which adjustment pattern to follow is what lies at the heart of the Hayekian approach to investment theory.

The Hayekian approach is shown heuristically in Figure 13.1, where we start at capital stock K_0 and then, at t*, we suddenly change our desired capital stock from K_0 to K*. The figure depicts four alternative investment paths from K_0 towards K*.

Path I represents "instant" adjustment type of investment (i.e. all investment happens at once at t* and no more investment afterwards). Path I′ represents an "even flow" adjustment path, with investment happening at a steady rate after t* until K* is reached. Path I′′ is the asymptotic investment path (gradually declining investment), while path I′′′ depicts a gradually increasing investment path. All paths, except for the first instant one, imply that "investment" flows will be happening during the periods that follow t*. Properly speaking, then, investment theory in the Hayekian perspective is concerned with analyzing and comparing paths such as I′ , I′′ and I′′′ .

Notes

Figure 13.1: Adjustment Paths towards K*



The "Keynesian" approach places far less emphasis on the "adjustment" nature of investment. Instead, they have a more "behavioral" take on the investment decision. Namely, the Keynesian approach argues that investment is simply what capitalists "do". Every period, workers consume and capitalists "invest" as a matter of course. This leads Keynesians to underplay the capital stock decision. This does not mean that Keynesians ignore the fact that investment is defined as a change in capital stock. Rather, they believe that the main decision is the investment decision; the capital stock just "follows" from the investment patterns rather than being an important thing that needs to be "optimally" decided upon beforehand. Thus, when businesses make investment decisions, they do not have an "optimal capital stock" in the back of their mind. They are more concerned as to what is the optimal amount of investment for some particular period. For Keynesians, then, optimal investment not about "optimal adjustment" but rather about "optimal behaviour".

Self Assessment

Fill in the blanks:

11. A cash discount is tantamount to a ..... in price.
12. A ..... is a graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility.
13. The quantity of a flow always depends on the ..... in consideration.
14. The NPV is ..... affected by the discount rate.
15. A ..... method is used to estimate the attractiveness of an investment opportunity.

13.4 Summary

- Capital investment creates the need for additional investment in inventory, accounts receivable and cash throughout the life of the plant and equipment.
- Usually, it is assumed that the costs resulting from changes in the working capital components or the cash benefits following from these components are imbedded in the cash flow of the investment.

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- On identifying the costs and benefits created by the working capital components and linking them explicitly to the total investment planning process, we analyse certain very important points.
- In the early life of an investment, it is operating below capacity, while later in the life cycle, there is often an increase in the operating capacity.
- The discounted cash flows related to cash, receivables, and inventories can range from a modest to the major proportion of the total cost of an investment.
- The need for additional investment in working capital is dependent on the type and size of investment, the size and growth of the market, the growth of the relative market share and length of the planning horizon.

13.5 Keywords

Decision Tree: A graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility.

Discounted Payback Period: Length of time required to recover the initial cash outflow from the discounted future cash inflows.

IRR: Stands for Internal Rate of Return. IRR is the rate of growth a project is expected to generate.

Real Options Analysis: A useful tool for stimulating thinking about a range of possible options and helping to make decisions on what to invest in. In particular, ROA helps to keep investment options open, and enable riskier approaches to be explored, without making long-term commitments to them.

13.6 Review Questions

1. How should companies address working capital management following global changes in the economy and in industry structures?
2. The Mobile Company receives the following cheques during January. Calculate the amount of opportunity costs for January for Mobile if the opportunity cost rate is 12% per annum.

Face Amount	Days Delay
1,00,000	4
1,50,000	5
50,000	3
75,000	6

3. Assume that a cash manager discovers that his firm is paying off its accounts payable at an average of two days early. If the firm changes this practice and pays the accounts on their due date, what is the effect on the disbursement float if credit purchases are ₹ 9.125 crore annually? If the available cash released can be invested in short-term securities at 10 per cent and the firm's tax rate is 40 per cent, what is the net benefit to the firm? Assume a 365-day year.
4. R.J. Mahajan, financial manager of the AMC Services, has been keeping the firm's fund in the First Growth Fund (FGF) a money market fund that pays 8 percent on deposits and has no charge for withdrawals. Mahajan has found another Fund, Grand Growth fund that pay

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10.5 per cent on deposits but has a ₹ 200 fee for withdrawal of any size, AMC Services has annual cash disbursements of ₹4 crore. Mahajan is considering establishing an account with GGF, transferring funds to FGF only occasionally, and using the FGF account to handle daily transaction.

(a) Using a 360-day year, find the daily disbursement of funds.

(b) When Mahajan makes a transfer, what the size of transfer be?

(c) How often should Mahajan make transfers?

(d) If Mahajan does not change to the GGF, what will be his average balance in the FGF (assuming the ₹ 4 crore for disbursements is available at the beginning of the year)? What annual interest will this account earn.

(e) If Mahajan establishes the GGF account, what will be his average balance and annual interest from FGF?

(f) What will be the average balance and the annual interest from GGF?

(g) What is the marginal value of establishing the GGF account?

5. What might be the benefit of tracking selected financial ratios in order to monitor the financial growth of a firm over time?

6. What corrective actions would you suggest to a firm which may not be operating under full capacity of the investment made?

7. What trend would be shown by the inventories of final products of a firm which is experiencing a negative shock to demand and why?

8. What would a firm do in order to make sure that it can carry out an investment plan that takes years without interruption due to lack of cash?

9. Suggest how a standard approach to investment planning may help in managing the cash flow crisis of a firm.

10. Do you agree/disagree with the statement that lengthening of payments on receivables that was not forecast can result in a cumulative shortfall in the actual cost inflows from an investment. Why/why not?

Answers: Self Assessment

1.	Capital	2.	capital
3.	no	4.	IRR
5.	lower	6.	cash flows
7.	negative	8.	greater
9.	optimal	10.	uncertain, dynamic
11.	reduction	12.	Decision Tree
13.	period	14.	highly
15.	valuation		

Notes

13.7 Further Readings

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Unit 14: Working Capital Management Practices in India

Notes

CONTENTS

Objectives

After studying this unit, you will be able to:

- Discuss the regulation of bank credit
- Explain the recent RBI guidelines regarding working capital finance
- Describe the working capital management in domestic and multinational enterprises
- Explain working capital management under inflation
- Discuss working capital and small scale industries

Introduction

Working capital is the fund invested in current assets and is needed for meeting day to day expenses. Working capital is the fund invested in current assets. It occupies an important place in a firm's Balance Sheet. Working capital financing is a specialized area and is designed to meet the working requirements of a business. The main sources of working capital financing are trade credit, bank credit, factoring and commercial paper.

The firms generally enjoy easy access to the bank finance for meeting their working capital needs. But from time to time, Reserve Bank of India has been issuing guidelines and directives to the banks to strengthen the procedures and norms for working capital financing.

14.1 Working Capital Financing by Banks

A commercial bank is a business organization which deals in money i.e. lending and borrowing of money. They perform all types of functions like accepting deposits, advancing loans, credit creation and agency functions. Besides these usual functions, one of the most important functions

Notes

of banks is to finance working capital requirement of firms. Working capital advances forms major part of advance portfolio of banks. In determining working capital requirements of a firm, the bank takes into account its sales and production plans and desirable level of current assets. The amount approved by the bank for the firm's working capital requirement is called credit limit. Thus, it is maximum fund which a firm can obtain from the bank. In the case of firms with seasonal businesses, the bank may approve separate limits for 'peak season' and 'non-peak season'. These advances were usually given against the security of the current assets of the borrowing firm usually; the bank credit is available in the following forms:

- ***Cash Credit:*** Under this facility, the bank specifies a predetermined limit and the borrower is allowed to withdraw funds from the bank up to that sanctioned credit limit against a bond or other security. However, the borrower can not borrow the entire sanctioned credit in lump sum; he can draw it periodically to the extent of his requirements. Similarly, repayment can be made whenever desired during the period. There is no commitment charge involved and interest is payable on the amount actually utilized by the borrower and not on the sanctioned limit.
- ***Overdraft:*** Under this arrangement, the borrower is allowed to withdraw funds in excess of the actual credit balance in his current account up to a certain specified limit during a stipulated period against a security. Within the stipulated limits any number of withdrawals is permitted by the bank. Overdraft facility is generally available against the securities of life insurance policies, fixed deposits receipts, Government securities, shares and debentures, etc. of the corporate sector. Interest is charged on the amount actually withdrawn by the borrower, subject to some minimum (commitment) charges.
- ***Loans:*** Under this system, the total amount of borrowing is credited to the current account of the borrower or released to him in cash. The borrower has to pay interest on the total amount of loan, irrespective of how much he draws.

Notes Loans are payable either on demand or in periodical installments. They can also be renewed from time to time. As a form of financing, loans imply a financial discipline on the part of the borrowers.

- ***Bills Financing:*** This facility enables a borrower to obtain credit from a bank against its bills. The bank purchases or discounts the bills of exchange and promissory notes of the borrower and credits the amount in his account after deducting discount. Under this facility, the amount provided is covered by cash credit and overdraft limit. Before purchasing or discounting the bills, the bank satisfies itself about the creditworthiness of the drawer and genuineness of the bill.
- ***Letter of Credit:*** While the other forms of credit are direct forms of financing in which the banks provide funds as well as bears the risk, letter of credit is an indirect form of working capital financing in which banks assumes only the risk and the supplier himself provide the funds.

Did u know? **What is letter of credit?**

A letter of credit is the guarantee provided by the buyer's banker to the seller that in the case of default or failure of the buyer, the bank shall make the payment to the seller. The bank opens letter of credit in favour of a customer to facilitate his purchase of goods. This arrangement passes the risk of the supplier to the bank. The customer pays bank charges for this facility to the bank.

Notes

- ***Working Capital Loan:*** Sometimes a borrower may require additional credit in excess of sanctioned credit limit to meet unforeseen contingencies. Banks provide such credit through a Working Capital Demand Loan (WCDL) account or a separate 'non–operable' cash credit account. This arrangement is presently applicable to borrowers having working capital requirement of ₹10 crore or above. The minimum period of WCDL keeps on changing. WCDL is granted for a fixed term on maturity of which it has to be liquidated, renewed or rolled over. On such additional credit, the borrower has to pay a higher rate of interest more than the normal rate of interest.

Self Assessment

Fill in the blanks:

1. The main sources of working capital financing are trade credit, bank credit, factoring and …….
2. The amount approved by the bank for the firm's working capital requirement is called ……..

14.2 Security Required in Bank Finance

Banks generally do not provide working capital finance without adequate security. The nature and extent of security offered play an important role in influencing the decision of the bank to advance working capital finance. The bank provides credit on the basis of following modes of security:

- ***Hypothecation:*** Under this mode of security, the banks provide working capital finance to the borrower against the security of movable property, generally inventories. It is a charge against property for the amount of debt where neither ownership nor possession is passed to the creditor. In the case of default the bank has the legal right to sell the property to realise the amount of debt.
- ***Pledge:*** A pledge is bailment of goods as security for the repayment of a debt or fulfillment of a promise. Under this mode, the possession of goods offered as security passes into the hands of the bank. The bank can retain the possession of goods pledged with it till the debt (principal amount) together with interest and other expenses are repaid. In case of non-payment of loan the bank may either; Sue the borrower for the amount due; Sue for the sale of goods pledged; or after giving due notice, sell the goods.
- ***Lien:*** Lien means right of the lender to retain property belonging to the borrower until he repays the debt. It can be of two types: (i) Particular lien and (ii) General lien. Particular lien is a right to retain property until the claim associated with the property is fully paid. On the other hand, General lien is applicable till all dues of the lender are paid. Banks usually enjoy general lien.
- ***Mortgage:*** Mortgage is the transfer of a legal or equitable interest in a specific immovable property for the payment of a debt. In case of mortgage, the possession of the property may remain with the borrower, while the lender enjoys the full legal title. 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.
- ***Charge:*** Where immovable property of one person is 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. A charge may be created by the act of parties or by the operation of law. It is only security for payment.

Notes

Task Find out the importance of security required in bank finance in India.

Self Assessment

Fill in the blanks:

3. Under ……. mode of security, the banks provide working capital finance to the borrower against the security of movable property, generally inventories.
4. A ……is bailment of goods as security for the repayment of a debt or fulfillment of a promise.

14.3 Regulation of Bank Credit

Till the sixties, bank credit for working capital was available easily and in convenient form to industrial borrowers. Further, the cash credit arrangement, the principal device through which such finance has been provided, is quite advantageous from the point of view of borrowers. Banks have not been concerning themselves about the soundness of the borrower or about the actual end use of the loan. Bank financing was mainly security oriented. This security oriented system tended to favour borrowers with strong financial resources irrespective of their economic function. This resulted in the concentration of economic power. Another problem was that the increase in the bank credit was not commensurate with the expansion in the level of inventory and production.

This resulted in a number of distortions in financing of working capital by banks. Major Banks was nationalized in 1969 and with that, approach to lending also changed. Consequently, bank credit has been subjected to various rules, regulations and controls. The basic objective of regulation and control of bank credit is to ensure its equitable distribution to various sectors of the Indian economy. The RBI has been trying, particularly from the mid-sixties onwards, to bring a measure of discipline among industrial borrowers and to redirect credit to priority sectors of the economy. The RBI has been issuing guidelines and directives to the banking sectors towards this end. Important guidelines and directives have derived from the recommendations of certain specially constituted groups assigned with the task of examining various aspects of bank finance to industry.

Task List out the important forms of working capital advance given by banks. Discuss the modes security required by banks in this context.

14.4 Recent RBI Guidelines Regarding Working Capital Finance

In the past, working capital financing was constrained with detailed regulations on how much credit the banks could give to their customers. The recent changes made by RBI in the guidelines for bank credit for working capital finance are discussed below:

1. The notion of Maximum Permissible Bank Finance (MPBF) has been abolished by RBI and a new system was proposed by the Indian Banking Association (IBA). This has given banks greater freedom and responsibility for assessing credit needs and credit worthiness. The salient features of new system are:

Notes

(a) For borrowers with requirements of up to ₹ 25 lakh, credit limits will be computed after detailed discussions with borrower, without going into detailed evaluation.

(b) For borrowers with requirements above ₹25 lakh, but up to ₹ 5 crore, credit limit can be offered up to 20% of the projected gross sales of the borrower.

(c) For large borrowers not selling in the above categories, the cash budget system may be used to identify the working capital needs. However, RBI permits banks to follow Tandon/Chore Committee guidelines and retain MPBF concept with necessary modifications.

2. Earlier RBI had prescribed consortium arrangements for financing working capital beyond ₹50 crore. Now it is not essential to have consortium arrangements. However, banks may themselves decide to form consortium so that the risks are spread. The disintegration of consortium system, the entry of term lending institutions into working capital finance and the emergence of money market borrowing options gives the best possible deal.

3. Banks were advised not to apply the second method of lending for assessment of MPBF to those exporter borrowers, who had credit export of not less than 25% of their total turnover during the previous accounting year, provided that their fund based working capital needs from the banking system were less than ₹1 crore. RBI has also suggested that the units engaged in export activities need not bring in any contribution from their long term sources for financing that portion of current assets as is represented by export receivables.

4. RBI had also issued lending norms for working capital, under which the banks would decide the levels of holding of inventory and receivables, which should be supported by bank finance, after taking into account the operating cycle of an industry as well as other relevant factors. Other aspects of lending discipline, viz; maintenance of minimum current ratio, submission and use of data furnished under quarterly information system etc. would continue though with certain modifications, which would make it easier for smaller borrowers to comply with these guidelines.

Self Assessment

State whether the following statements are true or false:

5. The basic objective of regulation and control of bank credit is to ensure its equitable distribution to various sectors of the Indian economy.

6. RBI permits banks to follow Tandon/Chore Committee guidelines and retain MPBF concept with necessary modifications.

14.5 Working Capital Management in Domestic and Multinational Enterprises

Although the fundamental principles governing the managing of working capital such as optimization and suitability are almost the same in both domestic and multinational enterprises, the two differ in respect of the following:

- MNCs, in managing their working capital, encounter with a number of risks peculiar to sourcing and investing of funds, such as the exchange rate risk and the political risk.
- Unlike domestic firms, MNCs have wider options of procuring funds for satisfying their requirements or the requirements of their subsidiaries such as financing of subsidiaries by the parent, borrowings from local sources including banks and funds from Eurocurrency markets, etc.

Notes

- MNCs enjoy greater latitude than the domestic firms in regard to their capability to move their funds between different subsidiaries, leading to fuller utilization of the resources.
- MNCs face a number of problems in managing working capital of their subsidiaries because they are widely separated geographically and the management is not very well acquainted with the actual financial state of affairs of the affiliates and working of the local financial markets. As such, the task of decision making in the case of MNCs' subsidiaries is complex.

Finance managers of MNCs face problems in taking financing decision because of different taxation systems and tax rates.

In sum, through MNCs have some advantages in terms of latitude and options in financing, the problems of working capital management in MNCs are more complicated than those in domestic firms mainly because of additional risks in the form of the currency exposure and political risks as also due to differential tax codes and taxation rates.

14.6 Working Capital Management under Inflation

It is desirable to check the increasing demand for capital, for maintaining the existing level of activity. Such a control acquires even more significance in times of inflation. In order to control working capital needs in periods of inflation, the following measures may be applied.

Greater disciplines on all segments of the production front may be attempted as under:

- The possibility of using substitute raw materials without affecting quality must be explored in all seriousness. Research activities in this regard may be undertaken, with financial assistance provided by the Government and the corporate sector, if any.
- Attempts must be made to increase the productivity of the work force by proper motivational strategies. Before going in for any incentive scheme, the cost involved must be weighed against the benefit to be derived. Though wages in accounting are considered a variable cost, they have tended to become partly fixed in nature due to the influence of various legislative measures adopted by the Central or State Governments in recent times. Increased productivity results in an increase in value added, and this has the effect of reducing labour' cost per unit.

Caution The managed costs should be properly scrutinized in terms of their costs and benefits.

Such costs include office decorating expenses, advertising, managerial salaries and payments, etc. Managed costs are more, or less fixed costs and once committed they are difficult to retreat. In order to minimise the cost impact of such items, the maximum possible use of facilities already created must be ensured. Further the management should be vigilant in sanctioning any new expenditure belonging to this cost.

The increasing pressure to augment working capital will, to some extent, be neutralised if the span of the operating cycle can be reduced. Greater turnover with shorter intervals and quicker realisation of debtors will go a long way in easing the situation.

Only when there is a pressure on working capital does the management become conscious of the existence of slow-moving and obsolete stock. The management tends to adopt ad hoc measures, which are grossly inadequate. Therefore, a clear-cut policy regarding the disposal of slow-moving and obsolete stocks must be formulated and adhered to. In addition to this, there should be an efficient management information system reflecting the stock position from various standpoints.

Notes

The payment to creditors in time leads to building up of good reputation and consequently it increases the bargaining power of the firm regarding period of credit for payment and other conditions. Projections of cash flows should be made to see that cash inflows and outflows match with each other. If they do not, either some payments have to be postponed or purchase of some avoidable items has to be deferred.

Case Study

Credit Decision

AGARWAL CASE

On August 30, 2006, Agarwal Cast Company Inc., applied for a $200,000 loan from the main office of the National bank of New York. The application was forwarded to the bank's commercial loan department.

Gupta, the President and Principal Stockholder of Agarwal cast, applied for the loan in person. He told the loan officer that he had been in business since February 1976, but that he had considerable prior experience in flooring and carpets since he had worked as an individual contractor for the past 20 year. Most of this time, he had worked in Frankfurt and Michigan. He finally decided to "work for himself" and he formed the company with Berry Hook, a former co-worker. This information seemed to be consistent with the Dun and Bradstreet report obtained by the bank.

According to Gupta, the purpose of the loan was to assist him in carrying his receivables until they could be collected. He explained that the flooring business required him to spend considerable cash to purchase materials but his customers would not pay until the job was done. Since he was relatively new in the business, he did not feel that he could compete if he had to require a sizeable deposit or payment in advance. Instead, he could quote for higher profits, if he were willing to wait until completion of the job for payment. To show that his operation was sound, he included a list of customers and projects with his loan application. He also included a list of current receivables.

Gupta told the loan officer that he had monitored his firm's financial status closely and that he had financial reports prepared every six months. He said that the would send a copy to the bank. In addition, he was willing to file a personal financial statement with the bank.

Question

Prepare your recommendation on Agarwal Cast Company.

Source: Sudhindra Bhat, *Financial Management – Principles and Practice*, Excel Books

14.7 Working Capital and Small Scale Industries

Small scale industries have a distinct set of characteristics such as low bargaining power leading to problems of receivables and lower credit on purchases, poor financial strength, high level of variability due to dependence on local factors, etc. Consequently, it has been rightly argued that the industry norms on different current assets cannot be adopted.

The P.R. Nayak Committee that was appointed to devise norms for assessing the working capital requirement of small-scale industries arrived at simplified norm pegging the Working Capital bank financing at 20% of the projected annual turnover. However, in case of units which are non-capital intensive such as hotels, etc. banks often assess requirements both on the Nayak Committee norms as well as the working cycle norms and take the lower of the two figures.

Notes

Eligibility and Norms for bank financing of SSIs as per Nayak Committee:

(a) Applicability: In case of SSIs, with working capital requirement of less than ₹ 5 crore In case of other industries, with working capital requirement of less than ₹1 crore.

(b) Quantum of Working Capital bank financing: 20% of the projected annual turnover.

(c) Subject to a Promoter bringing in a margin of 5% of the projected annual turnover (i.e. 20% of the total fund requirement that has been estimated at 25% of the projected annual turnover).

Self Assessment

State whether the following statements are true or false:

7. MNCs enjoy greater latitude than the domestic firms.
8. The managed costs should be properly scrutinized in terms of their costs and benefits.
9. Managed costs include office decorating expenses, advertising, managerial salaries and payments, etc.
10. Special economic zone have a distinct set of characteristics such as low bargaining power leading to problems of receivables and lower credit on purchases.

14.8 Summary

- Working capital is the fund invested in current assets. It occupies an important place in a firm's Balance Sheet. Working capital financing is a specialized area and is designed to meet the working requirements of a business.
- The amount approved by the bank for the firm's working capital requirement is called credit limit. Thus, it is maximum fund which a firm can obtain from the bank.
- A letter of credit is the guarantee provided by the buyer's banker to the seller that in the case of default or failure of the buyer, the bank shall make the payment to the seller.
- Banks generally do not provide working capital finance without adequate security. The nature and extent of security offered play an important role in influencing the decision of the bank to advance working capital finance.
- The nature and extent of security offered play an important role in influencing the decision of the bank to advance working capital finance.
- Bank financing was mainly security oriented. This security oriented system tended to favour borrowers with strong financial resources irrespective of their economic function.
- MNCs, in managing their working capital, encounter with a number of risks peculiar to sourcing and investing of funds, such as the exchange rate risk and the political risk.
- It is desirable to check the increasing demand for capital, for maintaining the existing level of activity. Such a control acquires even more significance in times of inflation.
- Small scale industries have a distinct set of characteristics such as low bargaining power leading to problems of receivables and lower credit on purchases, poor financial strength, high level of variability due to dependence on local factors, etc.

Notes

14.9 Keywords

Bills Financing: This facility enables a borrower to obtain credit from a bank against its bills.

Cash Credit: Under this facility, the bank specifies a predetermined limit and the borrower is allowed to withdraw funds from the bank up to that sanctioned credit limit against a bond or other security.

Commercial bank: A commercial bank is a business organization which deals in money i.e. lending and borrowing of money.

Letter of credit: A letter of credit is the guarantee provided by the buyer's banker to the seller that in the case of default or failure of the buyer, the bank shall make the payment to the seller.

14.10 Review Questions

1. What are the regulations of bank credit?
2. Write down the recent RBI guidelines regarding working capital finance.
3. Briefly explain the working capital management in domestic and multinational enterprises.
4. Write short note on working capital management under inflation and working capital and small scale industries.

Answers: Self Assessment

1.	commercial paper	2.	credit limit
3.	hypothecation	4.	pledge
5.	true	6.	true
7.	true	8.	true
9.	true	10.	False

14.11 Further Readings

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