BACHELOR OF COMPUTER APPLICATIONS

SEMESTER 4

DCA2204

PRINCIPLES OF FINANCIAL ACCOUNTING AND MANAGEMENT

Unit 7

Working Capital Management – I

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1. INTRODUCTION

Assets and liabilities of a company can be classified as follows:

- Assets – Fixed Assets and Current Assets.
- Liabilities – Long-term liabilities and short-term (Current) liabilities.

Assets are possessions/items of economic value owned by an individual or company which can be expressed monetarily or can be converted to cash like land, building, plant, etc. They can be tangible (land, building, plant) and intangible (goodwill, patents). Assets help in generating future revenues to the company. Fixed assets are those assets which are permanent in nature and are held to be used in creating income and wealth. They are not ordinarily for sale. Current assets are those assets which can be easily liquidated and encashed at a short notice usually within a year. Examples of current assets are debtors, short-term investments, cash and bank balances etc.

Liabilities are economic obligation that legally binds a company to settle a debt. Long term liabilities are those which are repayable over a period greater than the accounting period, example, debentures, term loans, etc. Short termliabilities or current liabilities have to be paid within the accounting period. For example, creditors, bills payable, outstanding expenses etc. Managing current assets assumes importance because of the fact that the liquidity position of a firm is dependent on the amount of investment in CA and the time value of money is less significant for CA than FA.

1.1 Objectives

After studying this unit, you will be able to:

- *Understand the meaning, definition and concepts of working capital.*
- *State the objectives of working capital management.*
- *Bring out the importance of working capital management.*
- *Explain the process of estimation of working capital.*
- *Explain the factors determining cash requirements.*
- *Explain the process of cash forecasting.*

2. COMPONENTS OF CURRENT ASSETS AND CURRENT LIABILITIES

2.1 Current Assets

- Inventories
- Sundry Debtors
- Bills Receivables
- Cash and Bank Balances
- Short-term Loans and Advances
- Short-term Investments

2.2 Current Liabilities

- Sundry Creditors
- Bills Payable
- Outstanding Expenses
- Tax Provision

What is working capital ?

Working capital management is **a business strategy designed to ensure that a company operates efficiently by monitoring and using its current assets and liabilities to their most effective use.** The efficiency of working capital management can be quantified using ratio analysis.

Working capital management involves managing the different components of current assets and current liabilities. It is an effort to try to maintain a healthy relationship between these two so that a satisfactory level of working capital is maintained. It is very important for a firm to maintain a satisfactory level of working capital, otherwise there are chances of the firm becoming insolvent and going bankrupt. The interface between CA and CL is therefore very important and forms the main subject under working capital management.

3. CONCEPTS OF WORKING CAPITAL

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

Gross working capital refers to the firm's investment in total current assets.

Net working capital refers to the difference between current assets and current liabilities. Net working capital is positive when CA exceeds CL and negative when CL exceeds CA.

A Finance Manager should ensure there is sufficient liquidity in the firm's operations. This is possible only when the CA and CL are managed efficiently. Liquidity of the firm is defined as the firm's ability to meet its short-term obligations as and when payable.

4. OBJECTIVE OF WORKING CAPITAL MANAGEMENT

Liquidity V. Profitability

The basic objective of working capital management is to maintain the smooth functioning of the normal business operations of a firm. The company has to decide on the sufficient quantity of working capital to be maintained. A company following a conservative approach will have more current assets at its disposal. Holding large amount of CA is not very advisable as the firms lose on the profitability aspect. They can earn more by putting these resources to alternative uses or by investing CA into short term investment avenues. This approach is dynamic in nature wherein only small amounts of cash are held by companies and the rest put to alternative uses. A firm following a conservative policy will tend to lose on profits and those following an aggressive policy will invest everything available and in the bargain loses on the liquidity element. A trade-off between these two variables is required for the smooth running of the company.

5. NEED FOR WORKING CAPITAL

We all have understood by now the importance of working capital in the day- to-day running of operations. Different firms have different requirements of working capital. One of the objectives of a firm is to maximize shareholders' wealth. To achieve this objective, the firm should earn good returns from its operations which mean that earning a steady amount of profit requires good amount of sales. The firm should invest adequately in current assets to enable it to generate sales continuously without any break. Sales do not convert into cash instantaneously and there is always an **operating cycle** involved in the conversion of sales into cash.

6. OPERATING CYCLE

It is the length of time required to convert sales into cash. This involves three phases:

- **Acquisition of resources –** procuring raw materials, labour, fuel, etc.
- **Manufacture of the product –** conversion of raw material into inventory.
- **Sale of the product –** conversion of sales into cash or credit in which case the firm has accounts receivable.

These three phases occur on a continuous basis and there is no synchronization. If it were possible to bring together the three phases there is no need for working capital management. Cash outflows occur before inflows and cash inflows are not certain because of the difficulty in forecasting sales accurately. Outflows, on the other hand are certain. Since these two do not match, firms should keep sufficient cash or invest in short- term liquid securities to enable them to meet obligations as and when they become due. Likewise, there should be sufficient stock of finished goods to meet unexpected demand from customers. Customers are known to change loyalty when they do not find products available as every product in the market is known to have a number of substitutes. Further, the firms should give sell goods on credit if they have to be competitive. To facilitate these, firms should have an adequate level of working capital.

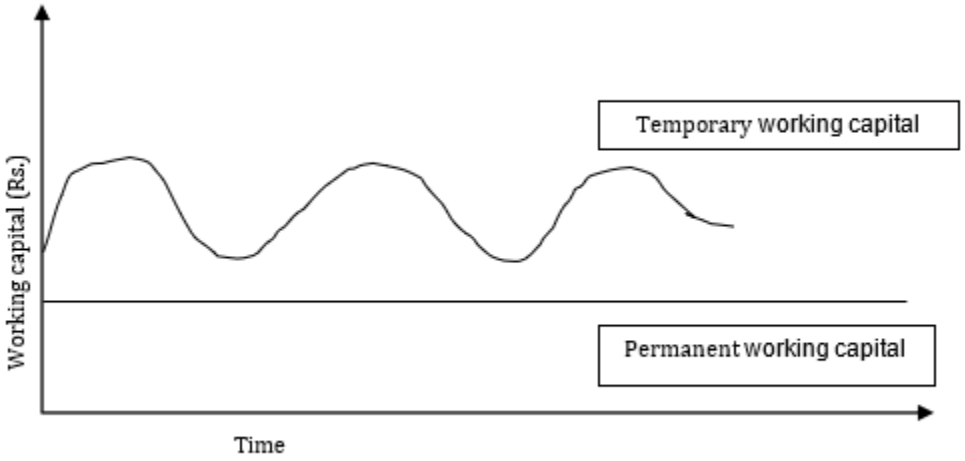
How is the length of the operating cycle determined? The length of OC is the sum total of:

- Raw Material storage period
- Conversion period
- Finished goods storage period
- Average collection period

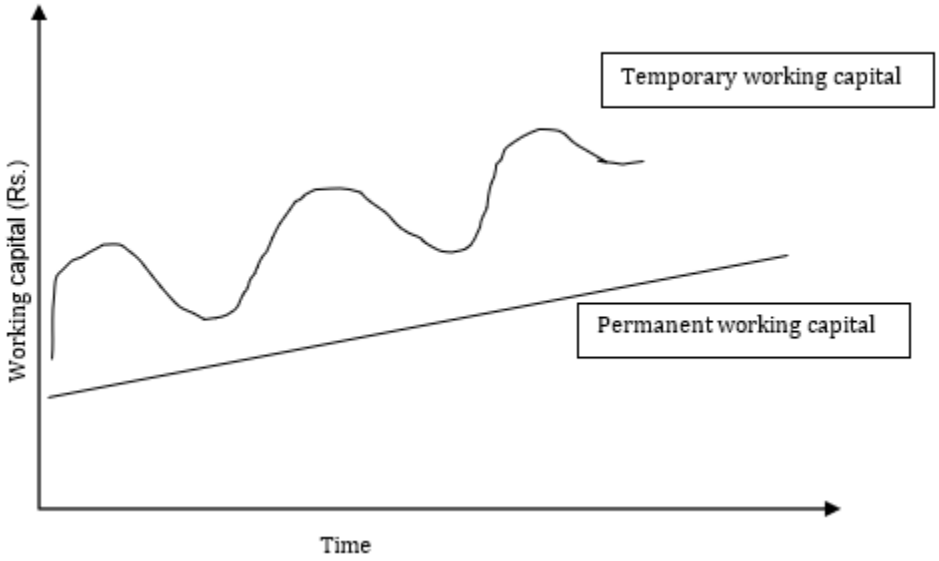
This total is referred to as **Gross Operating Cycle** (GOC). From this, the firm has to make payables which are the Average Payment Period. Subtracting payables deferrals from GOC, we get **Net Operating Cycle** or the **Cash Conversion Cycle**.

Permanent and Temporary Working Capital:

Permanent working capital is the minimum investment in the form of inventory of raw materials, work-in-progress, finished goods, stores and book debts to facilitate uninterrupted operations in a firm. This minimum level is called the **permanent or fixed working capital**. It is permanent like the firm's fixed assets are. Over and above this, the firm's working capital requirements fluctuate depending upon the cyclicality and seasonality of product demands. This is referred to as the **variable or fluctuating or temporary working capital**. These two aspects can be graphically shown as follows:



For a growing firm, the requirements can be depicted as follows:



Self-Assessment Questions - 1

1. _____ refers to the firm's investment in total current assets.
2. Net working capital is _____ when CA exceeds CL and_____ when CL exceeds CA.
3. A trade-off between these _____ and _____ is required for the smooth running of the routine affairs of the company.
4. _____is called as conversion of sales into cash.
5. The length of the operating cycle determined by _____ , _____ , _____ and _____ .

7. DETERMINANTS OF WORKING CAPITAL

A firm should plan its operations in such a way that there is neither too much nor too little working capital. Investing heavily on current assets will affect the firm's earning potential and having too little has an effect on the firm's credibility. Hence, as we have discussed earlier, it should strike a balance between liquidity and profitability elements. The requirements vary vary from time to time and from firm to firm. The following factors are identified as significant factors affecting the composition of working capital or current assets:

- **Nature of Business:** Working capital requirements are basically influenced by the nature of business. Trading organizations invest little on fixed assets and are have a large stock of finished goods, accounts receivable (arising out of credit sales) and accounts payables (due to credit purchases). In contrast, public utilities do not have large stocks of current assets and they invest heavily on fixed assets. On an average, the percentage of current assets to total assets are found to be lowest in hotels, restaurants and travel agents' offices (10%-20%) while it is in the range of 20%-30% in electricity generation companies and railways and they are in the range of 80%-90% in trading companies.

- **Nature of raw material used:** The nature of raw materials also influences the quantum of inventory. For example, if the raw material is based on the agricultural produce, the seasonality of production affects the raw material requirements. Consequently, the percentage of raw material inventory to total current assets will be very high. Some companies may depend on raw materials to be imported or which may have to be procured from other places. These companies will therefore hold large quantities of raw materials so that there are no production stoppage.

- **Sales and demand conditions/Business Cycle:** Companies which are growing will have large quantities of finished goods inventory. Sales depend on the demand conditions which vary depending on the seasonality and cyclicality of product demand. The upward swing in the economy, that is, during boom phase, sales rise rapidly bringing in new accounts receivables. An increase in sales will also necessitate

additional investment in fixed assets aiding production activities. This will in turn lead to an increase in creditors and accounts payable. Thus a boom phase has an all-round effect of steady production, high sales, increased accounts receivables and payables. On the other hand, during a slowdown period, there is depression everywhere. A company with seasonal sales may follow a policy of steady production and utilize its production resources to the fullest extent possible. This policy can lead to accumulation of inventories during off season and disposal during peak periods.

- **Processing technology:** The manufacturing cycle comprises the purchase and use of raw materials and production of finished goods. Longer the manufacturing cycle, larger is the firm's requirement of working capital. This will also lead to an extended manufacturing time span and larger tie-up of funds in inventory. In case the raw material has to go through several stages during the production process, the work-in-progress inventory is likely to be higher than any other item of current assets.

- **Production policy:** The quantity of working capital is also determined by the production policy in force. The seasonability of goods demanded and availability affects the finished goods inventory. A firm can have two options – either they confine to production only if demand is there or raw materials are available or they can follow a steady production policy throughout the year. The former is called variable production policy and has serious drawbacks like non-availability of skilled workforce to execute the orders in time or lack of physical facilities availability like power, transportation and infrastructure at the right time, etc. Following a steady production policy is a better alternative, but the shortcoming here is that there is a huge pile of finished goods inventories. Each product has a shelf-life after which it is not saleable in market. Steps should be therefore be taken to dispose them off quickly or otherwise the firm runs into possibilities of they become outdated or deteriorating in quality which again is a drain on company's profits.

- **Credit policy:** The Credit policy of the firm affects the working capital. The credit terms to be granted to customers depend on the industry norms. If the industry standard is 45 days and the firm restricts its credit terms to 20 days, it works heavily on the

company's sales. On the other hand, if the company follows the industry standard and grants credit of 45 days, extra efforts are to be put in towards collection. Incidence of bad debts is higher in such cases. Credit sales result in higher book debts. Higher book debts mean more working capital. In contrast, if liberal credit terms are available from suppliers, the working capital requirement is less.

In order to ensure that unnecessary funds are not tied up in debtors, the firm should follow a rationalized credit policy based on the credit standing of customers and other relevant factors.

- **Operational Efficiency:** The operating efficiency of the firm relates to the optimum utilization of resources at minimum costs. Investment in working capital will be low if a firm controls its operating costs and utilizes its assets in the most optimum way. Use of working capital is improved and the velocity of cash conversion cycle is stepped up. Better utilization of resources improves profitability and helps in reducing the pressure on working capital.

Self-Assessment Questions - 2

6. Trading organizations invest little on _____ and invest more on _____.
7. Growing companies have large quantities of _____ .
8. Longer the _____ , larger is the firm' requirement of working capital.
9. The seasonality of goods demanded and availability affects the _____inventory.
10. The working capital requirements are _____ if liberal credit terms are available from suppliers.
11. Better utilization of resources improves_____ and helps in reducing the pressure on working capital.

8. ESTIMATION OF WORKING CAPITAL

The two components of WC are CA and CL which have a bearing on the Operating Cycle. To compute the WC needs, we should find the holding period of various types of inventories, credit collection period and credit payment period. WC is calculated on the assumption that production/sales are a continuous process and all costs accrue similarly. The steps involved in estimating various items of CA and CL are as follows:

8.1 Estimation Of Current Assets

- **Raw Materials Inventory:** The investment in raw material inventory is estimated as:
  - [Budgeted production(units)*cost of raw material per unit*Average inventory holding period (months or days)] / [12 months or 365 days]
- **Work-in-progress inventory:** [Budgeted production(units)*Estimated WIP cost per unit*Average time span of WIP inventory months or (days)] / [12 months or 365 days]
- **Finished Goods inventory:** [Budgeted production(units)*cost of goods produced per unit excluding depreciation*finished goods holding period (months or days)] / [12 months or 365 days]
- **Debtors:** [Budgeted credit sales (units)*cost of sales per unit excluding depreciation *Average debt collection period (months or days)] / [12 months or 365 days]
- **Cash and Bank balances:** Apart from the WC needs for financing inventories and debtors, firms should also have some minimum cash balances with them. This amount will depend on the firm's attitude towards risk, access to borrowing sources, past experience, etc.

8.2 Estimation Of Current Liabilities

- **Trade Creditors:** [Budgeted yearly production(units)*raw material cost per unit*credit period allowed by creditors (months or days)] / [12 months/365days]
- **Direct Wages:** [Budgeted yearly production(units)*Direct labour cost per unit*Average time-lag in payment of wages (months or days)] / [12 months/365days]
- **Overheads:** [Budgeted yearly production(units)*overhead cost per unit* Average time-lag in payment of overheads (months or days)] / [12 months/365days]

Example:

You are the Financial Consultant for Zen Enterprises. The company wants you to advise them on the average amount of working capital required for the year 2007-08. The following estimates are made based on the previous year's working. You may add 15% to the computed amount for contingency purposes.

	Amount Rs
Average stock of finished goods	50000
Average stock of raw materials goods	80000
Average credit given to customers (sales) (4 weeks)	1000000
Average time lag in payment of wages 2 weeks	1000000
Average time lag in payment of materials 3 weeks	100000
Average time lag in payment of rent 3 months	60000
Average time lag in payment of salaries of clerks 2 weeks	80000
Average time lag in payment of salary of manager 2 weeks	20000
Average time lag in payment of sundry expenses 6 weeks	40000
Advance payment of sundry expenses (paid quarterly in advance)	25000

Solution

Statement showing working capital needs of Zen Enterprises

Current Assets	**Amount Rs.**
Stock of finished goods	10000
Stock of raw materials goods	20000
Debtors Credit sales/debtor's turnover=(1000000*4 weeks) / 52 weeks	76923
Advance payment of sundry expenses (25000*3 months) / 12 months	6250
Total investment in CA	**113173**
Current Liabilities	
Oustanding wages (1000000*2) / 52	38462
Outstanding materials (100000*3) / 52	5769
Outstanding Rent (60000*3) / 12	3462
Outstanding Salaries of clerks (80000*2) / 52	3077
Salary of manager (20000*2) / 52	769
Sundry expenses (40000*6) / 52	4615

Total investment in CL	**56154**
Net working capital CA—CL	**57019**
Add 15% contingency allowance (15% of 57019)	8553
Average WC	**65572**

Example:

Anu Foundries sells goods on a gross profit of 25%. Depreciation is taken into account as a part of cost of production. The following are the annual figures available to you.

Particulars	**Amount Rs.**
Sales 2 months credit	1000000
Materials consumed 1 month credit	200000
Wages paid 1 month lag	250000
Cash manufacturing expenses 1 month lag	180000
Administration expenses 1 month lag	80000
Sales expenses prepaid quarterly	40000
Advance Income tax payable	100000

The company maintains one month stock of raw materials and finished goods. It also has the practice of keeping Rs. 50000 as cash balance at all times. Estimate working capital requirements keeping 15% of the estimate as contingency reserve.

Solution

Current Assets	**Amount Rs.**
Debtors (cash cost of goods sold) (750000*2) / 12	125000
Prepaid sales expenses (40000*3) / 12	10000
Stock of raw materials (200000*1) / 12	16667
Stock of finished goods (630000*1) / 12	52500
Cash in hand given	50000
Total current assets	**254167**
Current liabilities	
Creditors (200000*1) / 12	16667
Manufacturing expenses (180000*1) / 12	15000
Administration expenses (80000*1) / 12	6667
Tax provision 100000/4	25000
Wages (250000*1) / 12	20833
Total Current liabilities	**84167**
Net working capital	**170000**
Add 15% for contingency reserve	25500
Average working capital needed	**195500**

Working notes:

Manufacturing expenses calculation

Sales	1000000
Less Gross profit 25% on sales	250000
Total cost of manufacture	750000
Less cost of materials	200000
Cost of wages	250000
Manufacturing expenses	**300000**

Depreciation calculation:

Manufacturing expenses	300000
Less cash manufacturing expenses	180000
Depreciation	**120000**

Calculation of total cash cost

Total cost of manufacture	750000
Less depreciation	120000
	630000
Add administration cost	80000
Add sales expenses	40000
Cost of goods sold	**750000**

9. CASH MANAGEMENT

Cash is the most important current asset for a business operation. It is the force that drives business activities and also the ultimate output expected by the owners. The firm should keep sufficient cash at all times. Excessive cash will not contribute to the firm's profits and shortage of cash will disrupt its manufacturing operations. The term 'cash' can be used in two senses – in a narrow sense it means the currency and other cash equivalents such as cheques, drafts and demand deposits in banks. In a broader sense, it includes near-cash assets like marketable securities and time deposits in banks. The distinguishing nature of this kind of asset is that they can be converted into cash very quickly. Cash in its own form is an idle asset. Unless employed in some form or another, it does not earn any revenue.

Cash management is concerned with (a) management of cash flows into and out of the firm, (b) cash management within the firm and

(c) management of cash balances held by the firm – deficit financing or investing surplus cash. Cash management tries to accomplish at a minimum cost the various tasks of cash collection, payment of outstanding's and arranging for deficit funding or surplus investment. It is very difficult to predict cash flows accurately. Generally, there is no correlation between inflows and outflows. At some points of time, cash inflows may be lower than outflows because of the seasonal nature of product sale thus prompting the firm to resort to borrowings and sometimes outflows may be lesser than inflows resulting in surplus cash. There is always an element of uncertainty about the inflows and outflows. The firm should therefore evolve strategies to manage cash in the best possible way. These can be broadly summarized as:

- **Cash planning:** Cash flows should be appropriately planned to avoid excessive or shortage of cash. Cash budgets can be prepared to aid this activity
- **Managing cash flows:** The flow of cash should be properly managed. Steps to speed up cash collection and inflows should be implemented while cash outflows should be slowed down.
- **Optimum cash level:** The firm should decide on the appropriate level of cash balance. Balance should be struck between excess cash and cash deficient stage.

- **Investing surplus cash:** The surplus cash should be properly invested to earn profits. Many investment avenues to invest surplus cash are available in the market such as, bank short term deposits, T-Bills, inter corporate lending etc.

The ideal cash management system will depend on a number of issues like, firm's product, competition, collection program, delay in payments, availability of cash at low rates of interests and investment opportunities available.

9.1 Motives Of Holding Cash

There are four motives of holding cash. They are:

Transaction motive: This refers to a firm holding cash to meet its routine expenses which are incurred in the ordinary course of business. A firm will need finances to meet a plethora of payments like wages, salaries, rent, selling expenses, taxes, interests, etc. The necessity to hold cash will not arise if there were a perfect co-ordination between the inflows and outflows. These two never coincide. At times, receipts may exceed outflows and at other times, payments outrun inflows. For such periods when payments exceed inflows the firm should maintain sufficient balances to be able to make the required payments. For transactions motive, a firm may invest its cash in marketable securities. Generally, they purchase such securities whose maturity will coincide with payment obligations.

Precautionary motive: This refers to the need to hold cash to meet some exigencies which cannot be foreseen. Such unexpected needs may arise due to sudden slow-down in collection of accounts receivable, cancellation of an order by a customer, sharp increase in prices of raw materials and skilled labour etc. The moneys held to meet such unforeseen fluctuations in cash flows are called *precautionary balances*. The amount of precautionary balance also depends on the firm's ability to raise additional money at a short notice. The greater the creditworthiness of the firm in the market, the lesser is the need for such balances. Generally, such cash balances are invested in highly liquid and low risk marketable securities.

Speculative motive: This relates to holding cash to take advantage of unexpected changes in business scenario which are not normal in the usual course of firm's dealings. It may also result in investing in profit-backed opportunities as the firm comes across. The firm may

hold cash to benefit from a falling price scenario or getting a quantity discount when paid in cash or delay purchases of raw materials in anticipation of decline in prices. By and large, business firms do not hold cash for speculative purposes and even if it is done, it is done only with small amounts of cash. Speculation may sometimes also boomerang in which case the firms lose a lot.

Compensating motive: This is yet another motive to hold cash to compensate banks for providing certain services and loans. Banks provide a variety of services like cheque collection, transfer of funds through DD, MT, etc. To avail all these purposes, the customers need to maintain a minimum balance in their account at all times. The balance so maintained cannot be utilized for any other purpose. Such balances are called **compensating balances**. Compensating balances can take any of the following two forms – (a) maintaining an absolute minimum, say for example, a minimum of Rs. 25000 in current account or (b) maintaining an average minimum balance of Rs. 25000 over the month. A firm is more affected by the first restriction than the second restriction.

9.2 Objectives Of Cash Management

This can be studied under two heads: (a) meeting payments schedule and

(b) minimize funds committed to cash balances.

Meeting payments schedule: In the normal course of functioning, a firm will have to make many payments by cash to its employees, suppliers, infrastructure bills, etc. It will also receive cash through sales of its products and collection of receivables. Both these do not happen simultaneously. A basic objective of cash management is therefore to meet the payment schedule in time. Timely payments will help the firm to maintain its creditworthiness in the market and to foster good and cordial relationships with creditors and suppliers. Creditors give a cash discount if payments are made in time and the firm can avail this discount as well. **Trade credit** refers to the credit extended by the supplier of goods and services in the normal course of business transactions. Generally, cash is not paid immediately for purchases but after an agreed period of time. There is deferral of payment and is a source of finance. Trade credit does not involve explicit interest charges, but there

is an implicit cost involved. If the credit terms are, say, 2/10, net 30, it means the company will get a cash discount of 2% for prompt payment made within 10 days or else the entire payment is to be made within 30 days. Since the net amount is due within 30 days, not availing discount means paying an extra 2% for 20-day period.

The other advantage of meeting the payments in time is that it prevents bankruptcy that arises out of the firm's inability to honour its commitments. At the same time, care should be taken not to keep large cash reserves as it involves high cost.

Minimize funds committed to cash balances: Trying to achieve the second objective is very difficult. A high level of cash balances will help the firm to meet its first objective discussed above, but keeping excess reserves is also not desirable as funds in its original form is idle cash and a non- earning asset. It is not profitable for firms to keep huge balances. A low level of cash balances may mean failure to meet the payment schedule. The aim of cash management is therefore to have an optimal level of cash by bringing about a proper synchronization of inflows and outflows and check the spells of cash deficits and cash surpluses. Seasonal industries are classic examples of mismatches between inflows and outflows.

Factors for efficient cash management

The efficiency of cash management can be augmented by controlling a few important factors described below:

Prompt billing and mailing: There is a time lag between the dispatch of goods and preparation of invoice. Reduction of this gap will bring in early remittances.

Collection of cheques and remittances of cash: It is generally found that there is a delay in the receipt of cheques and their deposits into banks. The delay can be reduced by speeding up the process of collection and depositing cash or other instruments from customers. The concept of '**float'** helps firms to a certain extent in cash management. Float arises because of the practice of banks not crediting firm's account in its books when a cheque is deposited by it and not debit firm's account in its books when a cheque is issued by it until the cheque is cleared and cash is realized or paid respectively. A firm issues and receives cheques on a

regular basis. It can take advantage of the concept of float. Whenever cheques are deposited with the bank, credit balance increases in the firm's books but not in bank's books until the cheque is cleared and money realized. This refers to '**collection float'**, that is, the number of cheques deposited into a bank and clearance awaited. Likewise, the firm may take benefit of '**payment float'**. The difference between payment float and collection float is called as '**net float'**. When **net float is positive**, the balance in the firm's books is less than the bank's books; when **net float is negative;** the firm's book balance is higher than in the bank's books.

9.3 Determining the Cash Needs – Models for Determining Optimal Cash

One of the prime responsibilities of a Finance Manager is to maintain an appropriate balance between cash and marketable securities. The amount of cash balance will depend on risk-return trade-off. A firm with less cash balances has a weak liquidity position but may be earning profits by investing its surplus cash and on the other hand it loses on the profits by holding too much cash. A balance has to be maintained between these aspects at all times. So how much is optimum cash? This section explains the models for determining the appropriate balance. Two important models are studied here – Baumol model and Miller-Orr model.

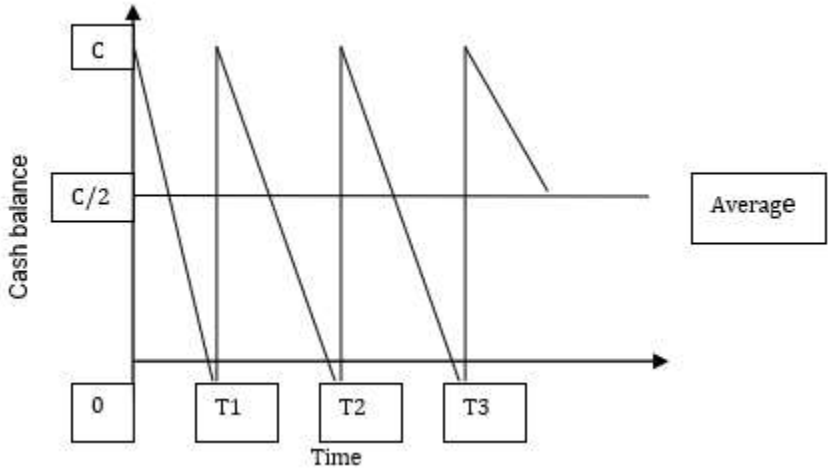
Baumol Model

The Baumol model helps in determining the minimum cost amount of cash that a manager can obtain by converting securities into cash. It is an approach to establish a firm's optimum cash balance under certainty. As such, firms attempt to minimize the sum of the cost of holding cash and the cost of converting marketable securities to cash. The Baumol model is based on the following assumptions:

- The firm is able to forecast its cash requirements in an accurate way.
- The firm's pay-outs are uniform over a period of time.
- The opportunity cost of holding cash is known and does not change with time.
- The firm will incur the same transaction cost for all conversions of securities into cash.

A company will sell securities and realizes cash and this cash is used to make payments. As the cash balance comes down and reaches a point, the Finance Manager replenishes its cash

balance by selling marketable securities available with it and this pattern continues. Cash balances are refilled and brought back to normal levels by the acts of sale of securities. The average cash balance is C/2. The firm buys securities as and when they have above-normal cash balances. This pattern is explained below:



Baumol's Model

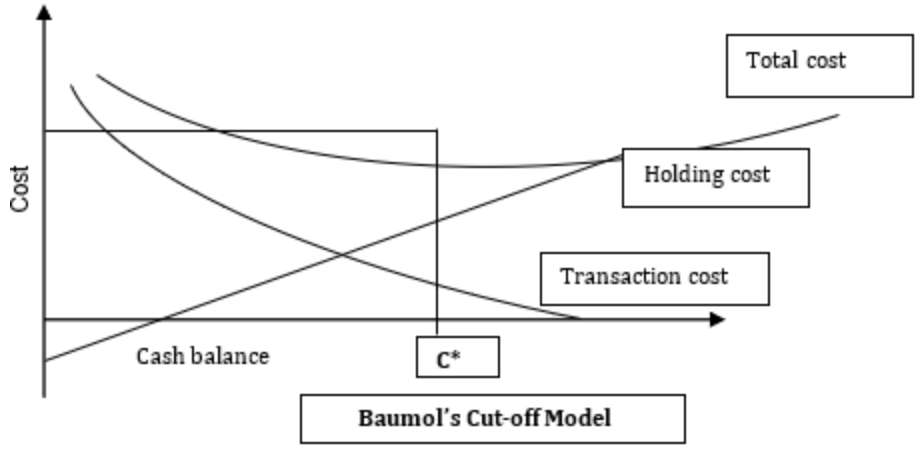
The total cost associated with cash management has two elements –

(a) cost of conversion of marketable securities into cash and (b) the opportunity cost.

The firm incurs a holding cost for keeping cash balance which is the opportunity cost. Opportunity cost is the benefit foregone on the next best alternative for the current action. Holding cost is k(C/2).

The firm also incurs a transaction cost whenever it converts its marketable securities into cash. Total number of transactions during the year will be the total funds requirement, T, divided by the cash balance, C, i.e. T/C. If per transaction cost is c, then the total transaction cost is c(T/C).

The total annual cost of the demand for cash is k(C/2) + c(T/C).



The optimum cash balance C* is obtained when the total cost is minimum which is expressed as $\mathbf{C^* = \sqrt{2cT/k}}$ where C* is the optimum cash balance, c is the cost per transaction, T is the total cash needed during the year and k is the opportunity cost of holding cash balance. The optimum cash balance will increase with increase in the per transaction cost and total funds required and decrease with the opportunity cost.

Example:

A firm's annual cost requirement is Rs. 20000000. The opportunity cost of capital is 15% per annum. Rs. 150 is the per transaction cost for the firm when it converts is short-term securities to cash. Find out the optimum cash balance. What is the annual cost of the demand for the optimum cash balance?

Solution

$\mathbf{C^* = \sqrt{2cT/k}} = \sqrt{[2(150)\ (20000000)]} / 0.15 =$ **Rs. 200000**

The annual cost is 150(20000000/200000) + 0.15 (200000/2) = **Rs. 30000.**

Example:

Mysore Lamps Ltd. requires Rs. 30 lakhs to meet its quarterly cash requirements. The annual return on its marketable securities which are of the tune of Rs. 30 lakhs is 20%. The conversion of the securities into cash necessitates a fixed cost of Rs. 3000 per transaction. Compute the optimum conversion amount.

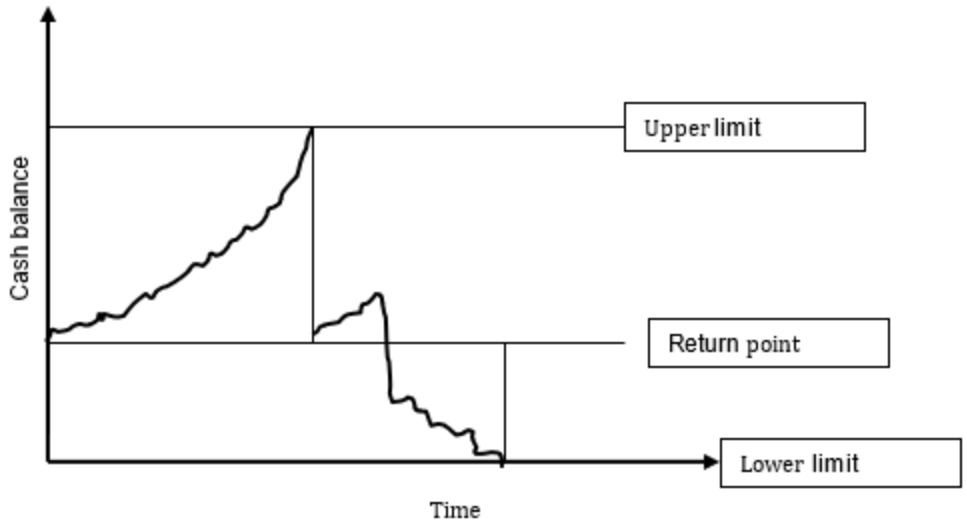
Solution

$C^* = \sqrt{2cT/k}$ = √ [2*3000*3000000] / 0.05@ = Rs. 600000

@ Is 20% / 4 as 20% is annual return and fund requirement is done on a quarterly basis.

Miller-Orr model

Miller-Orr came out with another model due to the limitation of the Baumol model. Baumol model assumes that cash flow does not fluctuate. In the real world, rarely do we come across firms which have their cash needs as constant. Keeping other factors such as expansion, modernization, diversification constant, firms face situations wherein they need additional cash to maintain their present position because of the effect of inflationary pressures. The firms therefore cannot forecast their fund requirements accurately. The Miller-Orr model overcomes this shortcoming and considers daily cash fluctuations. The MO model assumes that cash balances randomly fluctuate between an upper bound (upper control limit) and a lower bound (lower control limit). When cash balances hit the upper limit, the firm has too much cash and it is time to buy enough marketable securities to bring back to the optimal bound. When cash balances touch zero level, the level is brought up by selling securities into cash. Return point lies between the upper and lower limits. Symbolically, this can be expressed as $\mathbf{Z = 3\sqrt{3/4*(c\sigma^2/i)}}$ where Z is the optimal cash balance, c is the transaction cost, $\boldsymbol{\sigma^2}$ is the standard deviation of the net cash flows and i is the interest rate. MO model also suggests the optimum upper boundary b as three times the optimal cash balance and lower limit, i.e. **upper limit b=lower limit + 3Z** and **return point=lower limit + Z**. This is shown graphically as follows:



Miller-Orr Model

Example:

Mehta industries have a policy of maintaining Rs. 500000 minimum cash balance. The standard deviation of the company's daily cash flows is Rs. 200000. The interest rate is 14%. The company has to spend Rs. 150 per transaction. Calculate the upper and lower limits and the return point as per MO model.

Solution

$Z = 3\sqrt{3}/4*(c\sigma^2/i)$

$3\sqrt{3}/4*(150*200000^2) / 0.14/365$ = Rs. 227226

The Upper control limit = lower limit + 3Z = 500000 + 3*227226 =

Rs. 1181678

Return point = lower limit + Z = 500000 + 227226 = **Rs. 727226**

Average cash balance = lower limit + 4/3Z = 500000 + 4/3*227226 = **Rs. 802968**

Cash Planning

Cash planning is a technique to plan and control the use of cash. It helps in developing a projected cash statement from the expected inflows and outflows of cash. Forecasts are based on the past performance and future anticipation of events. Cash planning can be done on a daily, weekly or on a monthly basis. Generally, monthly forecasts are commonly prepared by firms.

Cash Forecasting and Budgeting

Cash budget is a device to plan for and control cash receipts and payments. It gives a summary of cash flows over a period of time. The Finance Manager can plan the future cash requirements of a firm based on the cash budgets. The first element of a cash budget is the selection of the time period which is referred to as the **planning horizon**. Selecting the appropriate time period is based on the factors exclusive to the firms. Some firms may prefer to prepare weekly budget while others may work out monthly estimates while some others may be preparing quarterly or yearly budgets. Firms should keep in mind that the period selected should be neither too long nor too short. Too long a period, estimates will not be accurate and too short a period requires periodic changes. Yearly budgets can be prepared by such companies whose business is very stable and they do not expect major changes affecting the company's flow of cash.

The second element that has a bearing on cash budget preparation is the selection of factors that have a bearing on cash flows. Only items of cash nature are to be selected while non-cash items such as depreciation and amortization are excluded.

Cash budgets are prepared under three methods:

1. Receipts and Payments method
2. Income and Expenditure method
3. Balance Sheet method

We shall be discussing only the receipts and payments method of preparing cash budgets.

Example:

Given below is the prepared a cash budget of M/s. Panduranga Sheet Metals Ltd. for the 6 months ending 30th June 2007. It has an opening cash balance of Rs. 60000 on 1st Jan 2007.

Month	Sales	Purchases	Wages	Production overheads	Selling overheads
Jan	60000	24000	10000	6000	5000
Feb	70000	27000	11000	6300	5500
March	82000	32000	10000	6400	6200
April	85000	35000	10500	6600	6500
May	96000	38800	11000	6400	7200
June	110000	41600	12500	6500	7500

The company has a policy of selling its goods 50% on cash basis and the rest on credit terms. Debtors are given a month's time period to pay their dues. Purchases are to be paid off two months from the date of purchase. The company has a time lag in the payment of wages of ½ a month and the overheads are paid after a month. The company is also planning to invest in a machine which will be useful for packing purposes, the cost being Rs. 45000, payable in 3 equal installments starting bi-monthly from April. It also expects to make a loan application to a bank for Rs. 50000 and the loan will be granted in the month of July. The company has to pay advance income tax of Rs. 20000 in the month of April. Salesmen are eligible for a commission of 4% on total sales effected by them and this is payable one month after the date of sale.

Solution

	Jan	Feb	March	April	May	June
Opening cash balance	**60000**	**85000**	**126100**	**153000**	**118850**	**150100**
Cash receipts:						
Cash sales	30000	35000	41000	42500	48000	55000
Credit sales		30000	35000	41000	42500	48000
Total cash available	**90000**	**150000**	**202100**	**236500**	**209350**	**253100**
Cash payments						
Materials			24000	27000	32000	35000
Wages	5000	10500	10500	10250	10750	11750
Production overheads		6000	6300	6400	6600	6400
Selling overheads		5000	5500	6200	6500	7200
Sales commission		2400	2800	3280	3400	3840
Purchase of asset				15000		15000
Payment of advance IT				20000		
Total cash payments	5000	23900	49100	117650	59250	79190
Closing cash balances	**85000**	**126100**	**153000**	**118850**	**150100**	**173930**

Working note:

Wages calculation

Jan	Feb	Mar	Apr	May	Jun
10000	11000	10000	10500	11000	12500
5000	5500-feb	5000-mar	5250-apr	5500-may	6250-jun
	5000-mar	5500-feb	5000-mar	5250-apr	5500-may
5000	10500	10500	10250	10750	11750

Self-Assessment Questions - 3

12. Management of cash balances can be done by _____ and_____ .
13. The four motives for holding cash are _____, _____ , _____ and_____ .
14. The greater the creditworthiness of the firm in the market lesser is the need for _____ balances.
15. _____refers to the credit extended by the supplier of goods and services in the normal course of business transactions.
16. When cheques are deposited in a bank, credit balance increases in the firm's books but not in bank's books until the cheque is cleared and money realized. This is called as _____ .
17. According to Baumol model, the total cost associated with cash management has two elements _____ and _____ .
18. The MO model assumes that cash balances randomly fluctuate between a _____ and a _____ .

10. SUMMARY

All companies are required to maintain a minimum level of current assets at all points of time. This level is the core or permanent working capital of the company. Over this level, working capital varies with the level of activities. Working capital management is concerned with determination of relevant levels of current assets and their efficient use. The dangers of holding excess current assets are unnecessary accumulation of stocks and inadequate working capital which stagnates growth.

The need for holding cash arises due to a variety of reasons – transaction motive, speculation motive, precautionary motive and compensating motive. The objective of cash management is to make short-term forecasts of cash position, investing surplus cash and finding means to arrange for cash deficits. Cash budgets help Finance Manager to forecast the cash position.

11. TERMINAL QUESTIONS

1. Miraj Engineering Co. has forecast its sales for the 3 months ending Dec. as follows:
   Oct. Rs. 500000 Nov Rs. 600000 Dec. Rs. 650000
   The goods are sold on cash and credit basis 50% each. Credit sales are realized in the month following the sale. Purchases amount to 50% of the month's sales and are paid in the following month. Wages and administrative expenses per month amount to Rs. 150000 and Rs. 80000 respectively and are paid in the following month. On 1st Dec. the company has purchased a testing equipment worth Rs. 20000 payable on 15th Nov. On 31st Dec. a cash deposit with a bank will mature for Rs. 150000. The opening cash balance on 1st Nov. is Rs. 100000. What is the closing balance in Nov. and Dec.?
2. The following data is available in respect of a company. A condition is laid by suppliers that the orders must be placed in multiples of 500 units only.
   Annual requirements 300000 units
   Purchase price per unit Rs. 3
   Cararying cost 25% of purchase price
   Cost per order placed Rs. 20 Find EOQ.

3. Nisha Ltd. wants to calculate EOQ. You are requested to help them. The following are the required data available.

   Annual demand 480 units Price per unit Rs. 4

   Carrying cost 40 Paise per unit Cost per order Rs. 5 per unit.

   Also calculate the number of orders per year and frequency of purchases.

12. ANSWERS

Self-Assessment Questions

1. Gross working capital
2. Positive, negative
3. Liquidity and profitability
4. Operating cycle
5. Raw Material storage period, Conversion period, Finished goods storage period and Average collection period
6. Fixed assets and current assets
7. Finished goods inventory
8. Manufacturing cycle
9. Finished goods
10. Less
11. Profitability
12. Deficit financing or investing surplus cash
13. Transaction, speculative, precautionary and compensating
14. Precautionary
15. Trade credit
16. Collection float
17. Cost of conversion of marketable securities into cash and opportunity cost.
18. Upper bound (upper control limit) and lower bound (lower control limit).

Terminal Questions

1.2, 3: Hint: Apply EOQ formula of $\mathbf{EOQ = \sqrt{2AS} / C}$