ANAND COMMERCE COLLEGE
(Managed by Shri Ramakrishna Seva Mandal)
BCOM SEM: VI (FINANCIAL MANAGEMENT - II)
UNIT:1 MANAGEMENT OF CASH, RECEIVABLES, INVENTORY

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[A] MANAGEMENT OF CASH	
❖	Introduction
❖	Meaning of cash
❖	Meaning of cash management
❖	Motives for holding cash
[B] MANAGEMENT OF RECEIVABLES	
❖	Introduction
❖	Meaning and nature of receivables
❖	Credit Policy Variables
❖	Credit Evaluation
[C] MANAGEMENT OF INVENTORY	
❖	Introduction
❖	Meaning
❖	Nature/Types of inventory
❖	Techniques of Inventory Management EOQ ABC Analysis Fixing Stock Level Reorder Point
Reference Book: ✓ Financial Management : I. M. Pandey ✓ Financial Management : M.R.Agrawal ✓ Financial Management : Khan & Jain	

DR MITTAL THAKKAR

[A] MANAGEMENT OF CASH

❖ INTRODUCTION

Cash is a highly liquid asset which is very essential to keep the business running on continuous basis. In a business firm, cash may be compared to the blood in the human body that gives life and strength to it. Similarly, cash imparts life, strength, profits and solvency to the business firm. That is why, *cash is aptly described as the oil to lubricate the ever-burning wheels of business, and without it the process grinds to a step.* A firm is, therefore, required to maintain a proper cash balance with it and that should be neither more nor less. The shortage of cash will hamper the manufacturing operations of the firm and excessive cash being idle will contribute nothing towards the profitability of the firm. Therefore, the important function of the financial manager is not only limited for proper utilization of cash, but he has to determine the minimum amount of cash in such a way that maximum profits can be earned by maintaining necessary liquidity in the firm.

❖ MEANING OF CASH

The term *'Cash' refers to those liquid assets or liquid resources owned by a firm which enable it to purchase goods or services. In narrow sense* cash comprises- cash on hand which includes notes and coins. It is also called petty cash. (b) Current accounts with scheduled and non-scheduled banks (demand deposits) earning no interest. The amount can be withdrawn or paid by cheque; (c) deposit accounts with banks (time deposits) earning interest. The amount can be withdrawn at a short notice. ***In broader*** *sense, 'Cash' includes 'cash equivalents' or 'near cash assets' known as 'marketable securities'. Cash equivalents* are referred to as highly liquid investments that are readily convertible into known amount of cash and that were within three months of maturity when acquired. *Marketable securities* refer to financial assets like treasury bills, notes, bonds, negotiable certificates of deposit, Euro Dollars, short term investments which are 'highly marketable and' can be converted into cash, their maturity period being less than a year. The word *'cash management' is generally used for cash or near cash assets i.e. for both type of assets.*

❖ MEANING OF CASH MANAGEMENT

Cash management involves the management of cash in such a way that sufficient cash in always available to meet the obligations of the firm. Moreover, as stated above, cash is also needed as a precautionary measure to meet the situations arising out of the uncertainties of cash flows. The crux of the problem is that for smooth running of an enterprise, cash must be available when needed. Inadequacy of cash may disturb payments and their functional schedules. The excess of cash would mean blocking of idle funds without taking advantage of potential opportunities and hence wastage of resources. Therefore, the purpose of cash management is- (i) to maintain proper cash level to meet the payment obligations, and (ii) to prevent cash being idle within the firm and thus looking opportunities of earning profit. In this light, cash management is the determination and maintenance of proper cash levels, controlling the flows of cash and investment of surplus (idle) cash so as to contribute to the .over all objective of the firm i.e. maximization of firm' value.

❖ MOTIVES FOR HOLDING CASH

Cash as an asset has a distinguishing characteristic and that it has no earning power of its own. Now, if cash does not earn anything on its own, why it is held by a, firm? In this regard, it has been propounded that Management of Cash and Marketable Securities are maintained with four motives as given below:

1. Transaction
2. Precautionary
3. Speculative
4. Compensating

1. Transaction Motive: Transaction motive is the most important reason for which cash balance is maintained by a firm. A firm needs cash to make payments for purchases, wages, operating expenses and financial charges in the form of taxes, dividends and interest. Therefore, it is necessary to hold cash to meet these day-to-day and routine cash requirements in the ordinary course of business. The need to hold cash arises because cash

DR MITTAL THAKKAR

receipts and cash payments are not perfectly synchronized. Sometimes cash receipts (inflows) exceed cash payments (outflows) or vice versa. So, the firm should maintain adequate cash balance to meet its obligations when outflows exceed inflows. When cash is retained by a firm, it is said to have been held with transaction motive. Thus, *transaction motive refers to holding of cash to meet anticipated obligations whose timings do not perfectly coincide with cash inflows.* If cash receipts and cash payments could synchronize in normal course, perhaps there would be no need to hold cash balance for transaction motive.

2. Precautionary Motive: The second main motive behind holding cash is to face unforeseen contingencies. Since every business has to face certain contingencies which are neither predictable nor any provision is made for them. Examples of such contingencies are strike, lock-out, fire, tough competition, sharp rise in raw material prices, slow recovery of accounts receivable etc. In such situations, the firm may require cash to meet additional obligations. Thus, *the precautionary motive of holding cash is to meet the unpredictable cash obligations of the firm.* The quantum of precautionary cash will depend upon the predictability of cash flows. As observed by *Michael Firth,* "the more uncertain the cash flows are, the greater the precautionary balances that have to be kept."

3. Speculative Motive: Sometimes, an unexpected opportunity outside the normal course of business may be available and a firm may wish to take advantage of it. Such opportunities may be purchase of raw material at the reduced prices on payment of immediate cash or delay the purchase of material in anticipation of declining prices or buying securities at a time when their prices fall on account of tight money conditions. Such situations are purely speculative in nature. Therefore, *when cash balances are maintained by a firm to take advantage of such situations, it is known as the speculative motive of holding cash.*

4. Compensating motive: It is a motive for holding cash to compensate banks for providing certain services or loans. Banks provide variety of services to the business concern, such as clearance of cheque, transfer of funds etc.

[B] MANAGEMENT OF RECEIVABLES

❖ INTRODUCTION

A business firm can sell goods or services on cash as well as on credit basis. In case of cash sales, payment is immediately received, but when goods or services are sold on credit basis, the payment is deffered for future. Receivables (debtors and bills) emerge on account of this credit facility extended by the firm to its customers. These receivables constitute a significant portion of working capital which is an important component of it after inventory. In India, in some business enterprises, the ratio of receivables to total assets ranges from 16% to 20% and they form about one third of total current assets. Though, this asset (receivables) is not financed separately from the capital market like other assets, still a substantial portion of the capital remains blocked in receivables in large business enterprises. That is why; an effective and efficient management of receivables is inevitable so that the investment in the receivables is kept at the optimum level.

DR MITTAL THAKKAR

❖ MEANING OF RECEIVABLES

Receivables arise when goods or services of a firm are sold on credit basis. Therefore, credit sales are receivables. According to Hampton, "receivables are asset accounts representing amount owned to the firm: as a result of the sale of goods or services in the ordinary course of business." Thus, receivables are an asset and represent claims of the firm against its customers. These are shown in the assets side of the balance sheet under titles such as bills receivables, notes receivables, sundry debtors, trade debtors, book debts, accounts receivables etc. These receivables are the result of extension of credit facilities to the customers. The objective of such facility is to allow the customers a reasonable time in which they can pay for the goods purchased by them. Receivables or debtors have the following characteristics:

(1) It Involves Risk: Risk is involved in receivables and it shall be analyzed carefully; This is because in credit sales cash payment is yet to be received, whereas, there is no such risk involved in cash sales.

(2) Based on Present Economic Value: In the case of credit sales, the economic value in the form of goods or services passes immediately to the customers, whereas, the seller expects an equivalent benefit i.e. cash at a later date.

(3) It Implies Futurity: The buyer makes the cash payment for goods or services received by him in future period.

❖ CREDIT POLICY VARIABLES

A firm makes significant investment by extending credit to its, customers. This requires a suitable and effective credit policy to control the level of total investment in receivables.

Credit policy refers to the application of those factors which influence the amount of trade credit, i.e. investment in receivables.

General economic conditions, competition, industry norms and pace of technology changes are the factors that affect the investment in receivables in an enterprise. But, the firm has almost no control over these factors. The credit policy of the firm will change as and when any external factor changes. Generally, firms identify the following <u>two types of credit policy</u>:

. Liberal or Lenient Credit Policy
. Stringent or Tight Credit Policy

(1) Lenient credit policy wherein credit sales are made liberally to those customers whose credit-worthiness is either doubtful or even is not known at all. In such case, the sales are made on liberal terms and favourable incentives are granted to customers that results in larger sales and higher profits. At the same time, it increases investment in receivables and the costs associated with it. Such a policy will also increase risk because of lower liquidity.

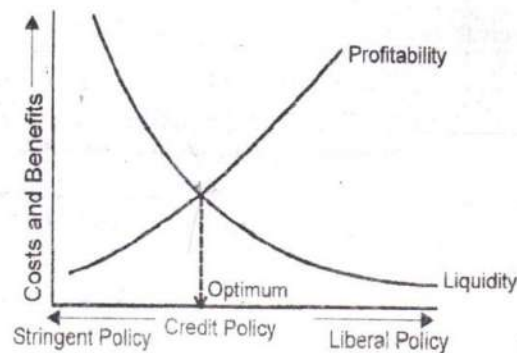
(2) Stringent credit policy wherein credit sales are made only to those customers whose credit-worthiness has been tested and is proved good. Firms following such policy are very selective in granting credit sales. In following such a policy, costs and bad debts will be minimum and no serious problem of liquidity is posed. But, at the same time, such a policy adversely affects the sales position and margin of profit, i.e. profitability.

The aforesaid description makes it clear that as the firm makes its credit policy more and more liberal, its liquidity decreases, whereas profitability increases. On the other band, if the

DR MITTAL THAKKAR

firm makes the credit policy more and more stringent, the liquidity may increase but the profitability will definitely go down. A firm therefore should try to frame its credit policy in such a way as to attain the best possible combination of profitability and liquidity so that the overall retum to the enterprise is maximized.

This has been depicted in the Figure given below:



The basic decision to be made regarding receivables is to decide how much credit be extended to the customer and on what terms. With this view; credit policy may be defined as the set of parameters and principles that govern the extension of credit to the customers. These parameters, also known as **components/Variables of credit policy**, are: (i) Credit Standards; (ii) Credit Terms; and (iii) Collection Policy.

(1) Credit Standards

While formulating the credit policy of a firm, the finance manager has to be ensured about the type of customers to whom the firm will extend credit facility. This decision is taken on the basis of credit standards. Credit standards are the guiding principles set by the credit control department to screen credit applicants in order to determine the selection of customers to whom credit can be offered and the amount of credit limit that can be offered. In nutshell, credit standards are the basic criteria for the extension of credit to customers. The quantitative basis of establishing credit standards are factors such as credit ratings, credit references, average payment period, financial ratios. When the credit standards of a firm are loose, the level of sales and receivables is likely to be high. The cost of credit administration and bad debts losses will also increase. As against this, when credit standards are relatively tight, the sales and receivables are likely to be low. Such standards will result in no bad debts losses and less cost of credit administration. Thus, the choice of optimum credit standards involves a trade-off between incremental return and incremental costs. The credit standards of a firm are influenced by factors such as:

The customer's willingness to pay;
The customer's ability to pay;
The customer's financial soundness;
The customer's assets that may be mortgaged; and
The conditions that are prevailing presently.

(2) Credit Terms

After determining credit standards and capability of the customer, the management has to determine those terms on which credit will be extended. *The credit terms refer to the set of*

DR MITTAL THAKKAR

stipulations or conditions under which the credit is extended to the customers. These relate to the payment of goods sold. The credit terms specify, how the credit will be offered including the length of the period, the interest on the credit and the cost of default. The credit terms relate to (i) credit period, (ii) cash discount, and (iii) discount period. These terms reflect a combination of the credit terms and written as “2/10 net 30”. It implies that if payment is made within 10 days, cash discount at the rate of 2% will be granted, otherwise the payment is to be made by 30th day, if the offer of discount is not availed. Thus, in this "2/10 net 30' abbreviation, cash discount is 2%, discount period is 10 days and credit period is 30 days.

Credit Period: *Credit period is the time duration for which the credit is extended to the customers.* Credit period is generally given as a net date. For example, when the terms of trade credit allowed by a firm indicates "net 30" it specifies that the payment is expected to be made by the 30th day from the date of credit sale. *Credit period affects demand of the products, average collection period and bad debt losses.*

Cash Discount: The second aspect of credit terms is cash discount. Such a discount is offered by business firms to motivate customers for making early payments of their bills. The rate of discount and the period for which it is granted is indicated in the terms of cash discount. In the event of customer not availing this opportunity of cash discount, he is required to make the payment by the date specified as credit period. For example, if credit terms are given as "3/15 net 45", it indicates rate of discount 3%, period of discount 15 days and credit period of 45 days. If payment is made "within 15 days, cash discount at the rate of 3% will be granted, otherwise payment is to be made by 45th day if the offer of discount is not availed. Cash discount also affects cost of capital, average collection period and bad debt losses.

(3) Collection Policy

Proper management of receivables requires an appropriate collection policy of the firm. Collection policy refers to the procedure adopted by a firm to collect payments due on past accounts. The basic objective of formulating a collection policy is to ensure the timely payment on receivables without loosing any customer. It helps the finance manager to tight the credit policy for slow paying customers. A strict or lenient, both types of collection policies have adverse effects on business. A strict collection policy can affect the goodwill and damage the growth prospectus of sales, while in a lenient collection policy; the customers with natural tendency towards slow payments will become even slower to settle their accounts. Therefore, a collection policy should be such that it may reduce the proportion of bad debt losses and shorter the average collection period. An important variable in collection policy is expenditure on collection. The greater the amount spent on collection efforts, the lower the proportion of bad debt losses and the shorter is the average collection period. Therefore, an optimum collection policy should be framed by the firm in such a way that the costs (collection expenditure) and benefits (reduction in bad debt losses and the cost of investment in receivables) arising from collections are in equilibrium and it should be pursued till benefits exceeds costs.

DR MITTAL THAKKAR

❖ **CREDIT EVALUATIONS**

Efficient credit management requires that a firm should formulate clear-cut guidelines and procedure for granting credit to individual customers. In other words, all the customers should not be treated equally while extending credit facilities to them. So, at the time of extending credit to the customers, the firm must know the credit worthiness of the customer i.e. whether a particular customer be extended any credit or not, and if yes, how much and on what conditions. The objective of such evaluation is to select those customers who satisfy the pre-determined norms of credit. The following steps are involved in this process:

(1) Collection of Information
(2) Credit Analysis
(3) Credit Decision or Credit Limit

(1) Collection of Information

Credit facilities should be provided to those customers only who possess the ability to make payments on due dates. This requires the firm, to collect enough credit information from different sources regarding credit worthiness of each customer. But the collection of credit information involves cost which should normally be less than the expected profits from the transactions. In case of small accounts, detailed information may not be collected and the decision regarding extending credit facility may be taken on the basis of limited available information. Besides cost effects of credit information, time factor is also involved in it. The time involved in the collection of credit information also affects the decision regarding grant of credit and such a decision cannot be delayed for long. Thus, keeping in view the cost factor and time factor, it is suggested that information may be collected through the following sources as given in figure below:

Financial Statements: The financial statements of an individual prospective customer can scrutinized very easily by going through his profit and loss account and balance sheet. The balance sheet provides information whether the customer has adequate assets to earn desired income to back the loan. Similarly, the profit and loss account gives information regarding sources of income production cost, working expenses, etc.

Credit Rating Institutions: Credit bureau or certain credit rating agencies provide in-depth information on the credit worthiness of different customers. These agencies gather info regarding credit history, biographies of the owners or executive officers, nature and size of financial position and behaviour of loan payments etc. of different, firms and sell it to the firms who want to extend credit. From these agencies, a special report in respect of a particular customer may also be obtained. In India. Credit Rating and Information System of India Limited (CRISIL) and Investment Information and Credit Rating Agency (IICRA) are operating.

Bank References: Information about the customer regarding his average balance, loans sanctioned, experience about his behaviour etc. can be obtained from different banks with whom the customer deals. Most commercial banks maintain separate credit department to perform credit investigations for their customers.

Trade References: The prospective customer may be asked to give the names of some of the businessmen with whom he is having dealings currently. After obtaining the names, these references can be contacted for providing the relevant credit information. If required,

DR MITTAL THAKKAR

the references should be personally collected for the desired information. The honesty and seriousness of the referees should also be examined as the customer can, sometimes, furnish misleading references.

Firm's own Experience: If the customer is not a new and he has old relations with the firm then information about his credit worthiness can be obtained from the credit department of the firm. The credit department of the firm maintains complete records of all his old customers regarding their financial position, managerial efficiency, promptness in payments, credit limit etc. The sales personnel may also supply important information about the customers.

In addition to the above mentioned sources, the credit information of the business firm, especially the large one, can be obtained from trade journals, periodicals, newspapers, trade directories, public records such as income tax statements, wealth tax and sales tax returns, revenue and municipal records.

(2) Credit Analysis

Collection of information in respect of any customer will not serve any purpose in itself unless it is analyzed to reach at some conclusion regarding the credit worthiness of a customer.

Credit analysis is the evaluation of the borrowing capacity of the applicant and promptness and repaying ability of a customer according to the terms of contract. To reduce the inherent risk in the loan, the credit worthiness of the applicant is analyzed in detail.

The well known **five C's of credit** i.e. Character, Capacity, Capital, Collateral and Conditions provide a framework for the evaluation of a customer. These characteristics as discussed below highlight the credit worthiness or default risk of the customer.

Character refers to the temperament of the customer. It is to be judged whether the customer is honest and is prompt in paying the dues that he had undertaken to pay. Credit evaluation has to be made taking into account this factor.

Capacity refers to the ability of the customer to pay back the purchase price. This can be measured by conducting a detailed investigation of his dealings, his past actions, his profession, his business methods etc. This investigation reveals whether the customer is capable of managing his business efficiently.

Capital refers to the financial soundness of the customer. This can be assessd by studying financial statements of the firm.

Collateral is a term used to express the additional ability of the customer. This measures the securities held by the customer which can be offered for the credit he avails.

Conditions refer to the economic conditions which influence the activities of the firm. If the conditions are unfavourable, the situation will not be good for extending credit to such firms.

From the aforesaid point of view, proper evaluation about the financial position of the customer should be made very carefully with the help of liquidity and other ratios to be computed from the data available in the published financial statements.

(3) Credit Decision or Credit Limit

After determining credit worthiness of the applicant, it is to be decided whether or not credit facilities should be provided to him. This requires matching of evaluated credit worthiness of

DR MITTAL THAKKAR

the applicant with the established credit standards of the firm. If the applicant is above of up to the standard, obviously credit facilities should be provided, otherwise not. If a decision is taken to extend the credit facilities to an applicant, the next step is to decide the amount and duration of credit. The decision in this regard depends on: (i) the amount of intended sales and (ii) the financial strength of the customer. A line of credit can be established in case of a frequent buyer which will avoid the need to investigate each order from him. A line of credit is the maximum amount of credit which can be extended by the firm at a given period. The line of credit can he fixed on the basis of customer's normal buying trend and the regularity in payments.

After determining the amount of credit, the firm has also to decide about the duration of credit. This may be the normal collection period as decided in the light of industry norms. If some customers request for the relaxation in the collection period, a comparison should be made between the costs for the extended period and the additional profit earned by the increased sales. The collection period should be extended if the profit thus earned exceeds the costs involved. .

Disclaimer: The study material is compiled by DR MITTAL THAKKAR. The basic objective of this material is to supplement teaching and discussion in the classroom in the subject.

[C] MANAGEMENT OF INVENTORY

❖ INTRODUCTION

Inventories, which comprise stock of raw material, work in progress and finished goods, constitute the most significant part of current assets for a large majority of companies in India. On an average, inventories are approximately 60 per cent of current assets in public limited companies in India. The research studies conducted on the management of inventory have revealed the fact that inventories, generally, constitute the second largest item next to fixed assets in the financial statements of manufacturing enterprises.

Because of the large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is, therefore, absolutely imperative to manage inventories efficiently and effectively, in order to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long term profitability and may fail ultimately. Mismanagement of inventory reduces the long-term profitability of the firm, as the shortage of inventory interrupts production and timely supply of goods to the customers. On the other hand, capital of the firm is tied-up in holding excessive inventory resulting in an increase in interest and storage costs. An efficient inventory management ensures continuous production by maintaining inventory at a satisfactory level. It also minimizes capital investment and cost of inventory by avoiding stock-pile of products. It is possible for a company to reduce its levels of inventories to a considerable degree, e.g., 10 to 20 per cent, without any effect on production and sales, by using simple inventory planning and control techniques. The reduction in 'excessive' inventories carries a favourable impact on a company's profitability.

❖ MEANING

DR MITTAL THAKKAR

- The dictionary meaning of the word 'inventory' is stock of goods. But, inventory means such type of assets which will be disposed of in future in the ordinary course of business.
- Bolten S. E. has defined it as, "inventory refers to the stock pile of the product a firm is offering for sale and, the components that make up the product."
- Inventory is defined as the sum total of value of raw material, work in progress and finished goods, though it depends largely upon the type of business.

❖ NATURE/TYPES OF INVENTORY

Inventories' are stock of the product a company is manufacturing for sale and components that make up the product. The various forms in which inventories exists in a manufacturing company are: raw materials, work-in-process and finished goods.

Raw materials

Raw materials are those basic inputs that are converted into finished product through the manufacturing process. Raw material inventories are those units which have been purchased and stored for future productions. E.g. iron ore in steel or oils seeds/groundnut in oil industry etc. The purpose of holding raw material is to ensure uninterrupted production in the event of delay in delivery and to take advantage of bulk or other favourable terms of purchase.

Work-in-process/Work in progress

Work-in-process inventories are semi- manufactured products. They represent products that need more work before they become finished products for sale. Such inventory helps to stabilize the rate of output at successive stages in the face of fluctuations of demand for product.

Finished goods

Finished goods inventories are those manufactured products which are ready for sale. Stocks of raw materials and work-in-process facilitate production, while stock of finished goods is required for smooth marketing. Thus, inventories serve as a link production and consumption of goods.

The levels of three kinds of inventory for a firm depend on the nature of its business. A firm will have substantially high levels of all three kinds of inventories, while a retail or wholesale firm will have very high level of finished goods inventory and no raw material and work in progress inventories.

Firms also maintain a fourth kind of inventory, supplies or stores and spare parts. Supplies include office and plant cleaning material like soap, brooms, oil, fuel, light bulbs etc. These materials do not directly enter production but are necessary for production process. Usually, these supp1ies are small part of the total inventory and do not involve significant investment. Therefore, a sophisticated system of inventory control may not be maintained for them.

❖ INVENTORY MANAGEMENT TECHNIQUES

In managing inventories, the firm's objective should be in consonance with the shareholder wealth maximization principle. To achieve this, the firm should determine optimum level of inventory. Efficiently controlled inventories make the firm flexible. Inefficient inventory control results in unbalanced inventory and inflexibility- the firm may sometimes run out of stock and

DR MITTAL THAKKAR

so may pile up unnecessary stocks. This increases the level of investment and makes the firm unprofitable.

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

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

The first question, how much to order, relates problem of determining economic order quantity (EOQ) and is answered with an analysis of costs of maintaining certain level of inventories. The second question, when to order, arises because of uncertainty and is a problem of determining the reorder point.

1. ECONOMIC ORDER QUANTITY (EOQ)

Introduction One important question that is to be answered by the Purchase Manager is **how much quantity is to be ordered at anyone point of time?** It will be noticed that there are **costs attached** to the ordering quantity. These costs are of two types, the first is the **ordering cost** and the other one is the **carrying cost.**

Ordering cost is the **cost of placing an order**. These costs include costs like handling and transportation costs, stationery costs, costs incurred for inviting quotations and tenders etc. The more is the frequency of order, the more are these costs. **Carrying cost** is the **real out of pocket cost** associated with having inventory on hand, such as warehouse charges, insurance, lighting, losses due to handling, spoilage, breakage etc, and another **important component of carrying cost is the amount of interest lost** due to the investment in the inventory. Carrying costs will go on increasing if the quantity of material in inventory goes on increasing. Both, the **carrying costs and the ordering costs are variable costs**, of **opposite behavior.** If orders are more frequent, ordering costs will go on increasing but as the material ordered will be in less quantity, the carrying costs will decrease. On the other hand, if numbers of orders are reduced, the quantity per order will increase and the carrying cost will increase. The ordering cost will come down due to reduction of number of orders. The **most desirable quantity** to be ordered is that quantity at which both, the **ordering costs and carrying costs will be minimum.** This quantity is called as 'Economic Order Quantity'.

Meaning of Economic Order Quantity (EOQ)

Re-order quantity is the quantity for which order is placed when the stock reaches reorder level. It is known as economic order quantity when it is the **quantity which is most economical to order.** The EOQ refers to the quantity of inventory, at which **total of ordering costs and the carrying costs is minimum.** At EOQ the **ordering costs are equal to carrying costs. Factors to be considered** EOQ is determined after considering the following factors:

1. Ordering Costs

The term 'Ordering Costs' refer to the costs incurred for acquiring inputs. These costs include

(i). Cost of placing an order,

(ii). Cost of transportation,

(iii). Cost of receiving goods,

DR MITTAL THAKKAR

(iv). Cost of inspecting goods.

There is an inverse relationship between order size and ordering cost.

Larger the order size	Lower the ordering costs because of fewer orders
Smaller the order size	Higher the ordering costs because of more orders

2. Carrying Costs

The term 'Carrying Costs refer to the costs incurred in maintaining a given level of inventory. These costs include -

(i). Cost of storage space,

(ii). Cost of handling materials,

(iii). Cost of Insurance,

(iv). Cost of deterioration or obsolescence,

(v). Cost of store staff.

There is **positive** relationship between order size and carrying cost

Larger the order Size	Higher the carrying costs because of high average inventory.
Smaller the order size	Lower the carrying costs because of low average inventory.

3. Annual consumption (usage) of inventory.

Annual consumption in unit terms shall be taken into consideration not in monetary terms Importance of EOQ The EOQ technique solves one of the major problems of the inventory management i.e. the order quantity problem by answering to the question: 'How much inventory should be ordered at a particular point of time?'

Economic order quantity can be calculated from any of the following methods-

1. Trial and Error Method
2. Formula Method
3. Graphic Method

1. Trial and Error Method

Under this method, annual requirements of goods or material are divided into different lot sizes and total inventory cost (carrying cost + ordering cost) for each lot size is calculated. In the last, the lot size where total inventory cost is minimum is chosen as EOQ or most profitable quantity to be purchased.

MITTAL THAKKAR

Particulars	Different Order Sizes		
	Order size I	Order size II	Order size III
(A). Annual Consumption (Units)	......	......	......
(B). Order Size (Units)	......	......	......
(C). No. of Order (A/B)	......	......	......
(D). Cost per order (Rs.)	......	......	......
(E). Total Ordering Cost (C X D)	......	......	......
(F). Average Inventory (Units) (Order Size / 2)	......	......	......
(G). Carrying cost per unit	......	......	......
(H). Total Carrying cost (F X G)	......	......	......
(I). Total Cost (E + H)	......	......	......

Where quantity discounts are offered by the supplier of inputs, the most economical purchase level is that order size at which the total cost (i.e. total annual ordering & carrying Costs + Total Purchase price of annual consumption of inputs) is minimum.

2. Formula Method

This method is used to avoid the computational difficulties of trial and error method. It is also known as 'Square Root Formula' or 'Wilson Formula' as given below:

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

EOQ = Economic Order Quantity

A=Annual requirement or consumption in units Ordering cost per order

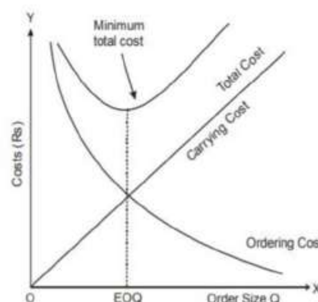
C= Carrying cost per unit per year

No. of Orders $= \frac{A}{EOQ}$

Time gap between two orders$= \frac{\text{No of days in ayear}}{\text{No.of orders}}$

3. Graphic Method

The economic order quantity can also be determined with the help of graph. Under this method, ordering costs, carrying costs and total inventory costs according to different lot sizes are plotted on the graph. The point at which the line of inventory carrying cost and the line of ordering cost intersect each other is the economic order quantity. At this point the total cost line is also minimum. While plotting graph costs like carrying, ordering and total are plotted on vertical axis (Y) while the order size is shown on horizontal axis (X).



2. ABC ANALYSIS

ABC analysis (Always Better Control) is an application of Management by exception' to the field of inventory control. Generally, the firm is confronted with thousand of different inventory items Most of these items are inexpensive, while other items are quite expensive and account for a large portion of firm's investment. It is an expensive and inextricable act to adopt a common policy and determination of economic order quantity and re-order point for the management of all these items of inventory. Therefore, under this technique all the items of inventory are classified in the following three categories i.e. A, Band C on the basis of usage rate, rupee value and criticality of the item:

(i) 'A' category items are of high value and maximum usages rate: Such items constitute 70% to 80% of inventory value, but only 5% to 10% of the total quantity of inventory and require strict control.

(ii) 'B' category items are of moderate value and usage rate. Such items constitute 20% to 25% of inventory value but only 20% to 30% of the total quantity of inventory and require lesser control.

(iii) 'C' category items are of low or negligible value and usage rate. The rest of the item representing 5% to 10% of inventory value but 60% to 70% of the total quantity of inventory fall in this category and require general control.

DR MITTAL THAKKAR

The above classification is illustrated in the following table:

Category	% of total Value	% of Total quantity
A	70-80	5-10
B	20-25	20-30
C	5-10	60-70

It is clear from the above table that ABC analysis classifies various inventory items in to three sets or groups of priority and allocates management efforts in proportion to their priority. The most important items are classified as class A, those of intermediate importance are classified as class B and the remaining as class C items. Thus, ABC analysis may be defined as a technique where inventories are analyzed according to their value so that costly items are given greater attention and care by the management. Accordingly, items of high value are subjected to closer control than the items of low value.

Objectives of ABC Analysis

The main purpose of ABC analysis is to indicate the degree of control required for inventories items of each category. For example, 'A' category items will require tight control because they represent a large percentage of total investment in inventories. It is because, there is more and more scope for fraud or error in case of A-items. Similarly, 'B' category items will require less control and 'C' category items will require general control for controlling pilferage and obsolesce in this method. So, control is exercised on selected more important items, hence it is also called Selective Inventory Control or 'Management by Importance and Exception '.

Process of ABC Analysis:

For implementation of ABC analysis technique in a firm, the following steps are to be taken:

(1) Classification: On the basis of expected use, the items of inventory are category-wise classified and per unit price of each item is determined.

(2) Ascertainment of total cost: Total cost of each item is determined by multiplying the expect units to be used by it's per unit price.

(3) Rank determination: Cost-wise ranks are assigned to each item of inventory. First rank assigned to the item with the highest total cost and so on.

(4) Computation of ratio or percentage: Ratios or percentages of number of units of each item to total units of all items and total cost of each item to total cost of all items.

(5) Determination of ABC category: Lastly, ABC categories are formed by combining the items on the basis of their relative value.

Advantages of ABC Analysis

(1) Savings in Time: In this method, the management has to concentrate his attention only on important items instead of all items of inventory. Thus, time saved can be used by the management in other functions of the organization.

(2) Scientific Procedure: The procedure adopted in ABC analysis is more scientific and systematic. Therefore, this function can easily be assigned to subordinates.

(3) Reduction in Inventory Costs: It helps in the fulfillment of the objective of maintaining inventory at the minimum cost. Under this method, ordering costs; carrying costs and stock out costs can be reduced.

(4) Control over Capital: In this method, only most costly items are controlled and more capital is invested in these items. This makes possible the control over capital.

DR MITTAL THAKKAR

(5) Use in Other Areas: This technique is based on the principle of 'Management by Exception'. Hence, it can profitably by used in other areas of business operations.

3. FIXATION OF STOCK LEVELS

A stock level is a level or quantitative limit which .is something standard that does not permit to exceed the limits. The stock levels for each item of inventory are fixed. These levels serve as a basis for initiating actions in time so that quantity of each item of inventory is controlled. However. it must be noted that these levels are not permanent but likely to be changed in accordance with the needs of the organization.

The experts have identified basically three levels viz. minimum, maximum and re-order. However in actual practice we do talk of two more levels as average level and danger levels. These levels are fixed by taking into account number of factors where one can not avoid level of usage or consumption over a period of time. The object of fixing stock levels for each item of material is to maintain required quantity of materials in the store and thereby the expenses may be reduced.

1. **Maximum stock level**

It is the stock level above which stock should not be allowed to rise. This is the maximum quantity of stock of raw materials which can be had in the stock. It is goes above, it will be overstocking.

Formula:

Maximum stock level = Re-order level + Re-ordering quantity -(Minimum consumption(Usage) x Minimum re-order period)

2. **Minimum stock level**

It represents the minimum quantity of an item of material to be kept in the store at any time. Material should not be allowed to fall below this level. If the stock goes below this level, production may be held up for want of materials. This stock is also known as safety stock level or buffer stock. In determining the minimum level the following factors are to be considered.

1. Lead time ie. Time required for getting fresh delivery of material.
2. Rate of consumption of material during the lead time.
3. Availability of substitute and re-order level

Formula:

Minimum stock level = Reorder level - (Normal usage /Avg. usage x Avg. lead time)

3. **Reorder stock level:** It is the point at which the storekeeper should initiate purchase requisition for fresh supply. This level lies between the maximum level and the minimum level. The re-ordering point is fixed slightly higher than the minimum stocks in such a way that the difference between minimum level and re-ordering level is sufficient to meet the demand for production up to the time of fresh supply. The level depends upon the lead time, rate of consumption and Economic order quantity (EOQ)

Formula: Re-order level = Maximum Usage x Maximum lead time

4. **Average stock level:**

This stock level shows the average quantity of materials kept in the store. This is regarded as the average of maximum and minimum stock levels.

DR MITTAL THAKKAR

Formula:

Average stock level = Maximum level + Minimum level / 2

If maximum stock level is not available.

Average stock level = Minimum level + ½ Reorder quantity

5. **Danger Level**

The very movement of the stock level fall below the minimum stock level, we are in danger. Therefore it lies below minimum level. The experts think that if the stock level is reaching to danger level, urgent action should be taken to procure the stock at any rate to prevent stock outs and dangers of it.

Formula:

Danger level= Maximum Usage/Avg. Usage x Maximum lead time for Emergency Purchase

4. REORDER POINT

The problem, how much to order, is solved by determining the economic order quantity, yet the answer should be sought to the second problem, when to order. This is a problem of determining the reorder point. The **reorder point** is that inventory level at which an order should be placed to replenish the inventory. To determine the reorder point under certainty, we should know: (a) lead time, (b) average usage, and (c) economic order

Computation:

The re-order point may be calculated under conditions of certainty in the following manner:

(a) With Safety Stock

Re-order Point = (Lead Time x Usage Rate) + Safety Stock

Or R.O.P. = (L x DR) + S

(b) Without Safety Stock

Re-order Point = Lead Time x Usage Rate

Or R.O.P. = Lx UR

Disclaimer: The study material is compiled by DR MITTAL THAKKAR. The basic objective of this material is to supplement teaching and discussion in the classroom in the subject. Students are required to go for extra reading in the subject through Library books recommended by Sardar Patel University, Vallabh Vidyanagar.

Question Bank

1) What is cash management? Explain motives for holding cash.
2) What are 5'C of credit evaluation of customers?
3) Write a note on
   i) Credit Policy ii) Credit Standard iii) Credit Terms
4) Write a note on Credit evaluation.
5) What is inventory? Explain nature/types of inventory.
6) Write a Short note on
   - EOQ
   - ABC Analysis

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