

UNIT 4: WORKING CAPITAL MANAGEMENT

PART I: GENERAL OVERVIEW ON WORKING CAPITAL

- Working capital is the capital available for conducting the day-to-day operations of an organization; normally the excess of current assets over current liabilities.
- Hence, working capital management is the management of all aspects of both current assets and current liabilities, to minimize the risk of insolvency while maximizing the return on assets.
- The task of the financial manager in managing working capital efficiently is to ensure sufficient liquidity of the enterprise.

Types of working capital:

(i) Permanent Working Capital

It is also known as Fixed Working Capital. It is the capital; the business concern must maintain certain amount of capital at minimum level at all times. The level of Permanent Capital depends upon the nature of the business.

(ii) Temporary Working Capital

It is also known as variable working capital. It is the amount of capital which is required to meet the Seasonal demands and some special purposes. It can be further classified into **Seasonal Working Capital** and **Special Working Capital**.

(iii) Semi Variable Working Capital

Certain amount of Working Capital is in the fixed level up to a certain stage and after that it will increase depending upon the change of sales or time.

WC may be classified as:

- o **Gross working capital** to represent the total amount of current assets, including cash, accounts receivable, and inventory.
- o **Net working capital** to represent the difference between current assets and current liabilities and indicate the liquidity of a business.
- o **Net Operating Working Capital** to represent the difference between a company's operating current assets and its operating current liabilities. It excludes any non-operational items.

Needs of working capital

Working Capital is needed for the following purposes:

1. **Purchase of raw materials and spares:** The basic part of manufacturing process is, raw materials. It should purchase frequently according to the needs of the business concern.
2. **Payment of wages and salary:** The next part of Working Capital is payment of wages and salaries to labour and employees. Periodical payment facilities make employees perfect in their work. So a business concern maintains adequate the amount of working capital to make the payment of wages and salaries.
3. **Day-to-day expenses:** A business concern has to meet various expenditures regarding the operations at daily basis like fuel, power, office expenses, etc.

Balanced Working Capital Position

A business concern must maintain a sound Working Capital position to improve the efficiency of business operation and efficient management of finance. Both excessive and inadequate Working Capital lead to some problems in the business concern:

A. Causes and effects of excessive working capital.

- (i) It leads to unnecessary accumulation of raw materials, components and spares.
- (ii) It results in locking up of excess Working Capital.
- (iii) It creates bad debts, reduces collection periods, etc.
- (iv) It leads to reduce the profits.

B. Causes and effects of inadequate working capital

- (i) It can not buy its requirements in bulk order.
- (ii) It becomes difficult to implement operating plans and activate the firm's profit target.
- (iii) It becomes impossible to utilize efficiently the fixed assets.
- (iv) The rate of return on investments also falls with the shortage of Working Capital.

Factors determining working capital requirements

- 1. Nature of business:** Working Capital of the business concerns largely depend upon the nature of the business. A transport company maintains lesser amount of Working Capital while a construction company maintains larger amount of Working Capital.
- 2. Production cycle:** If the production cycle length is small, they need to maintain lesser amount of Working Capital. If it is not, they have to maintain large amount of Working Capital.
- 4. Production policy:** It is also one of the factors which affects the Working Capital requirement of the business concern.

5. **Credit policy:** If the company maintains liberal credit policy to collect the payments from its customers, they have to maintain more Working Capital.
6. **Growth and expansion:** During the growth and expansion of the business concern, Working Capital requirements are higher.
6. **Availability of raw materials:** Raw materials are the basic components of the production process.
6. **Earning capacity:** A high level of earning capacity, they can generate more Working

WC and Funding Requirements

§ Working Capital Requires Funds

Maintaining working capital balance requires permanent commitment of funds

Example: Firm will always have minimum level of Inventory, Accounts Receivable, and Cash—this requires funding

§ Spontaneous Financing

- Firm will also always have minimum level of Accounts Payable—in effect, money you have borrowed.

Working Capital Trade-Offs

Inventory	
High Levels	Low Levels
Benefit: <ul style="list-style-type: none">• Happy customers• Few production delays (always have needed parts on hand) Cost: <ul style="list-style-type: none">• Expensive• High storage costs• Risk of obsolescence	Cost: <ul style="list-style-type: none">• Shortages• Dissatisfied customers Benefit: <ul style="list-style-type: none">• Low storage costs• Less risk of obsolescence
Cash	
High Levels	Low Levels
Benefit: <ul style="list-style-type: none">• Reduces liquidity risk Cost: <ul style="list-style-type: none">• Increases financing costs	Benefit: <ul style="list-style-type: none">• Reduces financing costs Cost: <ul style="list-style-type: none">• Increases liquidity risk

Working Capital Trade-Offs(Cont'd)

Accounts Receivable	
High Levels (favourable credit terms)	Low Levels (unfavorable terms)
Benefit: <ul style="list-style-type: none">• Happy customers• High sales Cost: <ul style="list-style-type: none">• Expensive• High collection costs• Increases financing costs	Cost: <ul style="list-style-type: none">• Dissatisfied customers• Lower Sales Benefit: <ul style="list-style-type: none">• Less expensive
Accounts Payable and Accruals	
High Levels	Low Levels
Benefit: <ul style="list-style-type: none">• Reduces need for external finance--using a spontaneous financing source Cost: <ul style="list-style-type: none">• Unhappy suppliers	Benefit: <ul style="list-style-type: none">• Happy suppliers/employees Cost: <ul style="list-style-type: none">• Not using a spontaneous financing source

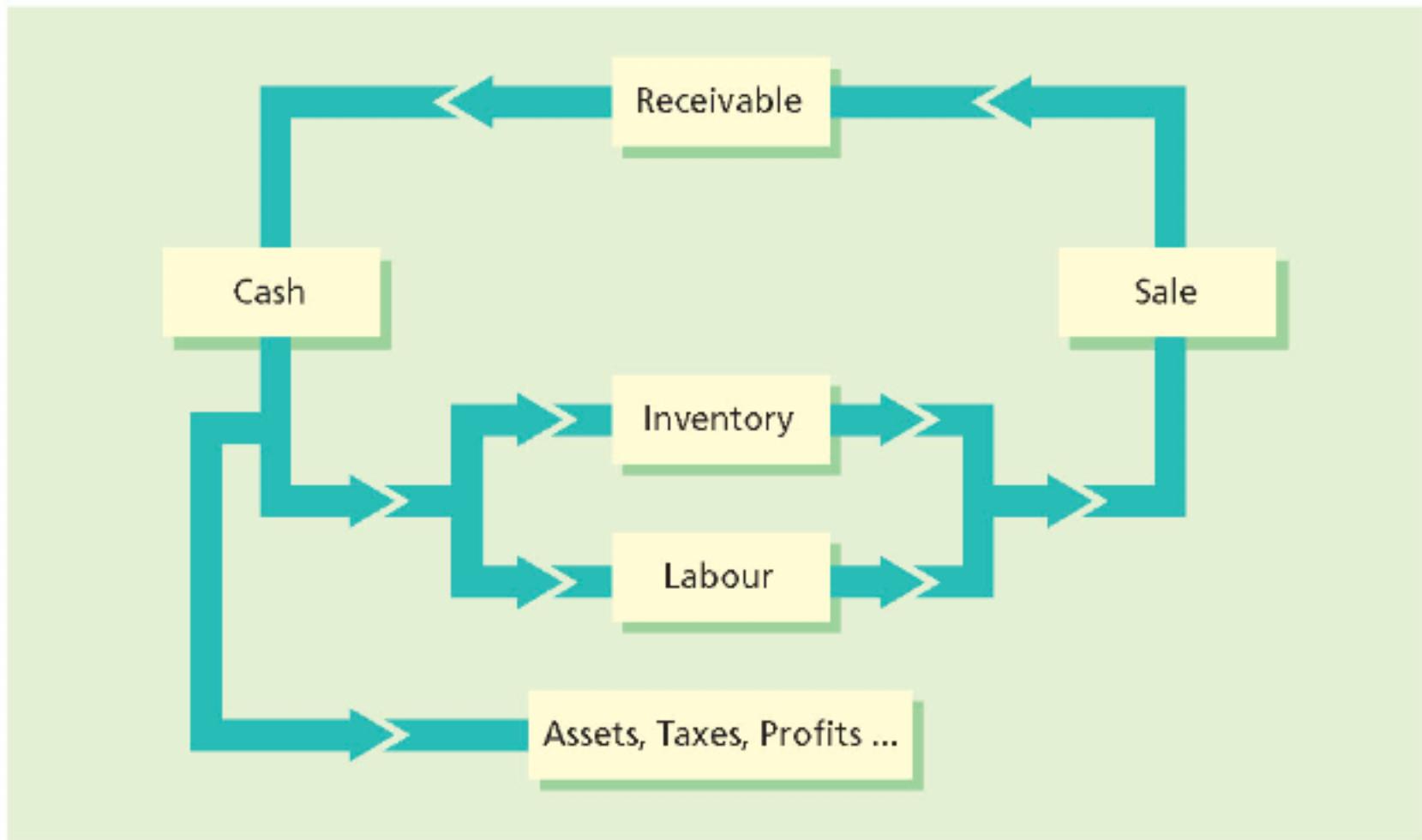
Operations—The Cash Conversion Cycle

The cash cycle, also known as the cash conversion cycle, measures how long it takes for a company to convert its investments in inventory and other resources into cash flows from sales.

It considers the length of time necessary to complete the following cycle of events:

- Conversion of cash into inventory
- Conversion of inventory into receivables
- Conversion of receivables into cash

Firm's **operating cycle** is time from acquisition of inventory until cash is collected from product sales



Operations—The Cash Conversion Cycle(Cont'd)

EVENTS

Purchase Inventory

Pay for Inventory

Sell Product

Collect Cash

PROCESSES

Inventory
Conversion
into Product

Receivables
Collection
Period

Payables
Deferral
Period

Cash
Conversion
Cycle

Operating
Cycle

Operations: Operating Cycle and Cash Conversion Cycle

Inventory conversion period

plus: Receivable collection period

equals: Operating cycle

minus: Payables deferral period

equals: Cash conversion cycle

Note: Shortening cash conversion cycle frees up cash to reinvest in business or to reduce debt and interest

4.4: Operations: Cash Conversion Cycle Analysis

$$\text{Inventory Conversion Period} = \frac{365}{\text{Inventory Turnover}}$$

Where Inventory Turnover = **(CGS/Average Inventory)**

$$\text{Receivables Collection Period} = \frac{\text{Accounts Receivable} \times 365}{\text{Annual Credit Sales}}$$

$$\text{Payables Deferral Period} = \frac{\text{Accounts Payable} \times 365}{\text{Cost of Goods Sold}}$$

Operations—The Cash Conversion Cycle

For a manufacturing business, the cash operating cycle is calculated as:

<i>Raw materials holding period:</i>	x
<i>Less: payables' payment period</i>	(x)
<i>WIP (work in process) holding period</i>	x
<i>Finished goods holding period</i>	x
<i>Receivables' collection period</i>	x

	x

Operations—The Cash Conversion Cycle

For a wholesale or retail business, there will be no raw materials or WIP holding periods, and the cycle simplifies to:

Inventory holding period	x
Less: payables' payment period	(x)
Receivables' collection period	x
<hr/>	
	x

Operations—The Cash Conversion Cycle

Example 1:

A company has provided the following information:

- Receivables collection period: 56 days
- Raw material inventory holding period: 21 days
- Production period (WIP): 14 days
- Suppliers' payment period: 42 days
- Finished goods holding period: 28 days

Calculate the length of both operating cycle and cash cycle

Operations—The operating Cycle

- Raw materials inventory holding period: 21 days
- WIP holding period: 14 days
- Finished goods holding period: 28 days
- Receivables' collection period: 56 days

Cash Conversion Cycle (days) : 119 days

Operations—The Cash Cycle

- Raw materials inventory holding period: 21 days
- Less: Suppliers' payment period: (42) days
- WIP holding period: 14 days
- Finished goods holding period: 28 days
- Receivables' collection period: 56 days

Cash Conversion Cycle (days) : 77 days

Operations—The Cash Conversion Cycle

Example 2: The following details are available for XYZ Ltd. for the year ended 31.03.2017 :

Sales 80,000

Costs of goods 56,000

Inventory

31/03/2016 9,000

31/03/2017 12,000

Accounts Receivables

31/03/2016 12,000

31/03/2017 16,000

Account Payable

31/03/2016 7,000

31/03/2017 10,000

What is the length of the operating cycle? What is the cash conversion cycle? Assume 365 days in the year.

Operations—The Cash Conversion Cycle

Answer :

Operating Cycle = Inventory Conversion Period
+ Accounts Receivables Conversion Period

Inventory Conversion Period

= Average Inventory x 365

Annual Cost of goods sold

= (9,000 + 12,000) / 2 x 365 = **68.4 days**
56,000

Receivables Conversion Period:

= Average Accounts Receivables x 365
Annual Sales

= (12000 + 16000) / 2x365 = **63.9 days**
80000

§ **Payables Conversion Period:**

= Average Accounts Payables x 365
Annual Cost of goods sold
= (7000 + 10000) / 2x365 = **55.54 days**
156000

§ Operating Cycle = ICP + RCP

$$= 68.4 + 63.9 = \mathbf{132.3 \text{ days}}$$

§ Cash Conversion cycle = OC - PCP

$$= 132.3 - 55.54 = \mathbf{76.76 \text{ days}}$$

The Cash conversion cycle shows the time interval over which additional nonspontaneous sources of working capital financing must be obtained to carry out firm's activities.

Note: An increase in the length of operating cycle, without a corresponding increase in payable deferral period, increases the cash conversion cycle. Any increase in cash conversion cycle leads to additional working capital needs of the firm.

Operations: Cash Conversion Cycle Analysis

- The length of the cycle depends on how **the balancing act between liquidity and profitability is resolved**, the efficiency of management and the nature of the industry.
- The optimum level is the amount that results in **no idle or unused inventory, but that does not put a damage on liquid resources**.
- Any assessment of the acceptability or otherwise of the length of the cycle **must take into account the nature of the business involved**.

- A supermarket chain will tend to have a very low or negative cash cycle – they have very few, if any, credit customers, they have a high inventory turnover and they can negotiate quite long credit periods with their suppliers.
- A construction company will have a long cycle – their projects tend to be long-term, often extending over more than a year, and even as progress payments may be made by the customer (if there is one), the mass of the cash will be received towards the end of the project.

Working Capital Financing Mix

- One of the most important decisions involved in the management of working capital is how current assets will be financed.
- What proportion of current assets should be financed by current liabilities and how much by long-term sources? Decisions on such questions will determine the financing mix.
- There are three basic approaches to determine an appropriate financing mix: **Hedging approach** (or the matching approach), **conservative approach**, and **trade-off between these two**.

Working Capital Financing Mix (Cont'd)

a) Hedging approach:

- With reference to an appropriate financing-mix, the term hedging can be said to refer to the process of matching maturities of debt with the maturities of financial needs.
- According to this approach, the maturity of the source of funds should match the nature of the assets to be financed.
- According to the hedging approach, the permanent portion of funds required should be financed with long-term funds and the seasonal portion with short-term funds.

There would, therefore, be no NWC.

b) Conservative approach:

- This approach suggests that the estimated requirement of total funds should be met from long-term sources; the use of short-term funds should be restricted to only emergency situations or when there is an unexpected outflow of funds.
- Long-Term Financing Benefits
 - Less worry in refinancing short-term obligations
 - Less uncertainty regarding future interest costs
- Long-Term Financing Risks
 - Borrowing more than what is necessary
 - Borrowing at a higher overall cost (usually)
- Result
 - Manager accepts less expected profits in exchange for taking less risk.

Risk consideration

- ☒ **Hedging approach:** the hedging approach is riskier in comparison to the conservative approach:
 - ☒ As already observed, there is no NWC with hedging approach because no long-term funds are used to finance short-term seasonal needs: current assets are just equal to current liabilities.
 - ☒ The hedging approach involves almost full utilization of the capacity to use short-term funds and in emergency situations it may be difficult to satisfy the short-term needs.
- ☒ **Conservative approach:** the company does not use any of its short-term borrowings. Therefore, the firm has sufficient short-term borrowing capacity to cover unexpected financial needs and avoid technical insolvency.

c) Trade-off between the hedging and conservative approaches:

- It has been shown that the hedging approach is associated with high profits as well as high risk, while the conservative approach provides low profits and low risk. Obviously, neither approach by itself would serve the purpose of efficient working capital management.
- A trade-off between these two extremes would give an acceptable financing strategy.
- The exact trade-off between risk and profitability will differ from case to case depending on risk perception of the decision makers.
- One possible trade-off could be equal to the average of the minimum and maximum monthly requirements of funds during a given period of time. This level of requirement of funds is called the **average monthly requirement**.

PART II: Management of the Working Capital components

- Working capital in general practice refers to the excess of CA over CL
- Management of working capital therefore is concerned with the problems that arise in attempting to manage the CA, the CL and the inter-relationship that exists between the two.
- The basic goal of working capital management is to manage the CA and the CL of firm in such a way that a satisfactory level of WC is maintained.
- Working capital management policies of a firm have a great effect on its profitability, liquidity and structural health of the organisation.

A. Inventory Management

(1) Organizations hold inventories for a variety of reasons. Among the most important reasons are the following:

- a) To meet anticipated demand
- b) To be able to buy or produce in economic lot sizes
- c) To maintain optimum inventory to maximize the profitability
- d) To avoid both over stock and under stock of inventory
- e) To maintain flexibility in scheduling
- f) To display items in order to accommodate customer selection

(2) Risk of holding inventory:

- g) The holding of inventory is risky because of the capital investment and the potential for obsolescence.
- h) A second form of risk is the possibility that the product will be pilfered or become obsolete
- i) It is important to understand that the nature and extent of risk vary depending on an enterprise's position in the distribution channel

Components/types of inventory

Raw Materials

Works -in -Progress

Finished Products

Stores & Spares

5.1 Inventory Cost

(a) Costs of high inventory levels:

Carrying inventory involves a major working capital investment and therefore levels need to be very tightly controlled. The cost is not just that of purchasing the goods, **but also storing, insuring, and managing them once they are inventory.**

(b) Costs of low inventory levels:

If inventory levels are kept too low, the business faces alternative problems:

- **Stock out:** if a business runs out of a particular product used in manufacturing it may cause interruptions to the production process. Alternatively, running out of goods held for onward sale can result in dissatisfied customers and perhaps future lost orders.
- **Re-order/setup costs:** each time inventory runs out, new supplies must be acquired.
- **Lost quantity discounts:** purchasing items in bulk will often attract a discount from the supplier. If only small amounts are bought at one time in order to keep inventory levels low, the quantity discounts will not be available.

5.2 Inventory Management Objectives

The objective of good inventory management to determine:

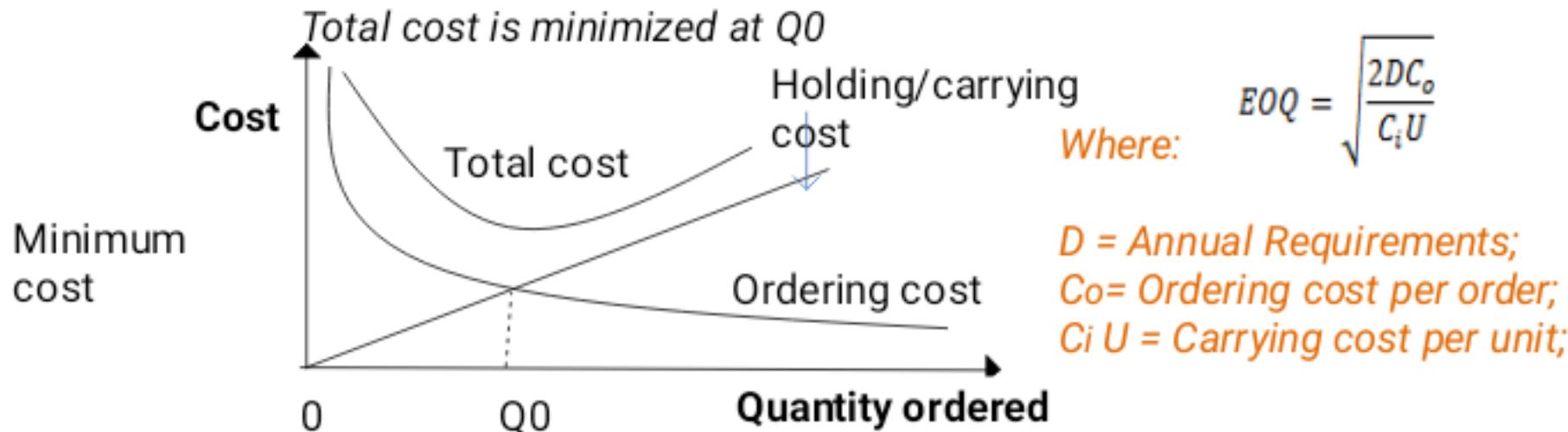
- **The optimum re-order level:** how many items are left in inventory when
- **The optimum re-order quantity:** how many items should be ordered when the order is placed (Economic Order Quantity)

(a) Reorder Point/level

- The reorder point determines when a resupply shipment should be initiated.
- This discussion focuses on determining reorder point under conditions of demand and performance cycle certainty. The certainty conditions imply that future demands and performance cycle lengths are known.
- **The basic reorder point formula is:**
- $R = D \times T$
- When there is uncertainty in either demand or performance cycle length, an inventory buffer is necessary to compensate for the uncertainty.
- $R = D \times T + SS$ (where SS = safety or buffer stock in units)

5.2 Inventory Management Objectives

- (b) **The optimum re-order quantity:** how many items should be ordered when the order is placed (**Economic Order Quantity**)



- a. This figure shows that the total ordering cost for any particular item is decreasing as the size per order is increasing.
- b. The total annual carrying cost is increasing with the increase in order size. This will happen because the firm would be keeping more and more items in the stores.
- c. However, the total cost of inventory (e.g., the total carrying cost + the total ordering cost) initially reduces with the increase in size of order but then increases with the increase in size of order.
- d. **The trade off** of these two costs is attained at the level at which the total annual cost is minimized. At this particular level, the order size is designated as **the EOQ**.

5.2 Inventory Management Objectives(Cont'd):

Economic order quantity models:

Economic order quantity (EOQ) models answer the question of how much to order.

Economic order size:

- The economic order size model is one the most widely used decision models for independent demand ordering. Assumptions of the model are:
- The objective of an EOQ analysis is to identify the order size that will minimize the sum of annual holding (carrying) and ordering (replenishment) costs. Purchasing costs are not included in the analysis because they are the same regardless of order size, and shortage costs need not be considered because it is assumed shortages can be avoided.
- Annual holding cost is the product of average inventory, $Q/2$, and unit holding cost, C_i . In some instances, inventory carrying cost is expressed as a percentage of unit price instead of as a constant, or fixed amount of money.

5.2 Inventory Management Objectives(Cont'd):

Example: The following information is available in respect of an item:

Annual usage: 20,000 units; ordering cost: \$1,875 per order; Carrying cost: \$3 per unit per annum. **Find out the economic order quantity of the item and also verify the results.**

- Solution:**

$$EOQ = \sqrt{\frac{2DC_o}{C_i U}} = \sqrt{\frac{2 \times 20,000 \times 1,875}{3}} = 5,000$$

The results can be verified as follows:

- a) If the order size is 5,000 units

$$\text{Total order cost} = \$1,875 \times 4 = \$7,500$$

$$\text{Carrying cost} = (5,000/2) \times \$3 = \$7,500$$

$$\text{Total annual cost} = \$15,000$$

- b) If the order size is 4,000 units:

$$\text{Total order cost} = \$1,875 \times 5 = \$9,375$$

$$\text{Carrying cost} = (4,000/2) \times \$3 = \$6,000$$

$$\text{Total annual cost} = \$15,375$$

- c) If the order size is 6,000 units:

$$\text{Total order cost} = \$1,875 \times 3.33 = \$6,243.75$$

$$\text{Carrying cost} = (6,000/2) \times \$3 = \$9,000$$

$$\text{Total annual cost} = \$15,243.75$$

5.2 Inventory Management Objectives(Cont'd):

Exercises :

- 1) Kigali Corporation requires 2,000 units of a certain item per year.
The purchase price per unit is \$30, the carrying cost of inventory is 25% of the inventory value, and the fixed cost per order is \$1,000.
 - a) Determine the EOQ;
 - b) What will be the total cost of carrying and ordering inventories when 4 orders of equal size are placed?
- 2) The finance Department of Kigali Import & Export LtD gathered the following information:
 - The carrying cost per unit of inventory is : \$10
 - The fixed cost per order : \$20
 - The number of units required: 30,000 per year
 - The variable cost per unit ordered: \$2
 - The purchase cost price per unit: \$30

Determine the EOQ, total number of orders in a year, and the time-gap between two orders.

5.2 Inventory Management Objectives(Cont'd):

- The EOQ model is a useful technique of inventory management as it tells the quantity to order and also the time to order. It helps in deciding when to replenish the inventory and also the quantity to be replenished.

Assumptions of the economic order quantity model:

- a) Annual demand is known, either through a forecast or because of customer orders.
- b) Items will be withdrawn from inventory at a uniform rate.
- c) A constant order size, Q, will be used.
- d) Unit cost is independent of order size. Hence, quantity discounts are not a consideration.
- e) Orders will be received in their entirety rather than piecemeal.
- f) Replenishment lead times are known and constant.
- g) No shortages will be permitted.

5.2 Inventory Management Objectives(Cont'd):

2°) Total Cost:

- The total annual cost of holding and ordering inventory is the sum of these two, which is:

$$TC = \frac{D}{Q} C_o + \frac{Q}{2} C_i U$$

- The first term on the left-hand side is the ordering cost, obtained as the product of the number of orders (D/Q) and the cost per order (C_o), and the second term on the right-hand side is the carrying cost, obtained as the product of the average value of inventory holding ($QP/2$) and the percentage carrying cost (C_i).
- The inventory holding cost includes: Housing (building) cost, Material handling costs, Labour cost, Inventory investment costs, and Pilferage, scrap, & obsolescence.

Exercises:

1. A firm's estimated demand for a material during the next year is 2500 units. Acquisition costs are \$400 per order and carrying costs are \$50 per unit. The **safety stock is set at 5% of the EOQ**. The daily usage is 8 units, and the lead time is 5 working days. You are requested to calculate:
 - a) The EOQ
 - b) The re-order point/Level

a) The EOQ = $\sqrt{\frac{2 * 2500 * 400}{50}}$ units

b) Re-order point/ level

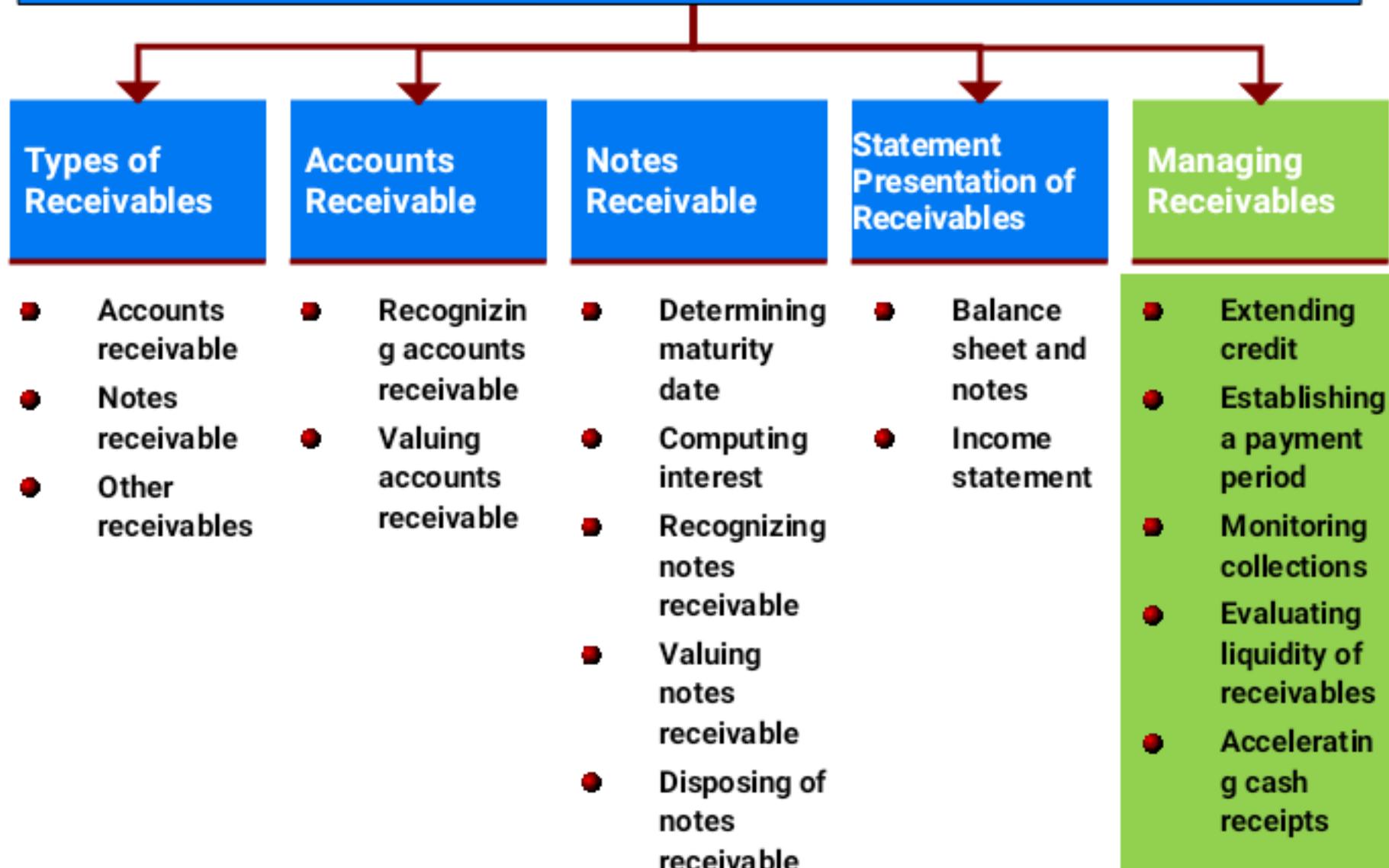
$$\text{Safety stock} = (200 * 5\%) = 10 \text{ Units}$$

$$\begin{aligned}\text{Re-order point} &= (5 \text{ days} * 8 \text{ units}) + 10 \text{ units} \\ &= 40 + 10 = 50 \text{ units}\end{aligned}$$

2. A company buys an item that costs \$5. The carrying cost of inventory is approximately 20% of the inventory value. It costs \$50 to place, process and receive an order. The annual requirement is 900 units.
- a) Calculate the EOQ
 - b) Determine the total ordering cost
 - c) Determine the total number of orders
 - d) Determine the total cost
 - e) Assume 300 working days in the year; calculate the time gap between orders in days (order cycle)

B. Managing Accounts Receivable

Reporting and Analyzing Receivables



Types of Receivables

Amounts due from individuals and other companies that are expected to be collected in cash.

Amounts owed by customers that result from the sale of goods and services.

**Accounts
Receivable**

Claims for which formal instruments of credit are issued as proof of debt.

**Notes
Receivable**

“Nontrade” (interest, loans to officers, advances to employees, and income taxes refundable).

**Other
Receivables**

Managing receivables



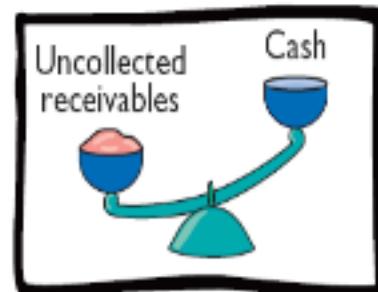
1. Determine to whom to extend credit



2. Determine a payment period



3. Monitor collections



4. Evaluate the liquidity of receivables



5. Accelerate cash receipts from receivables

1. Extending Credit

- ◆ If the **credit policy is too tight**, you will lose sales.
- ◆ If the **credit policy is too loose/ Liberal**, you may sell to customer who will pay either very late or not at all.
- ◆ It is important to **check references** on potential new customers as well as periodically to check the financial health of continuing customers.

Trade-off in managing Accounts Receivable

Liberal Management:

More sales and gross margin, but

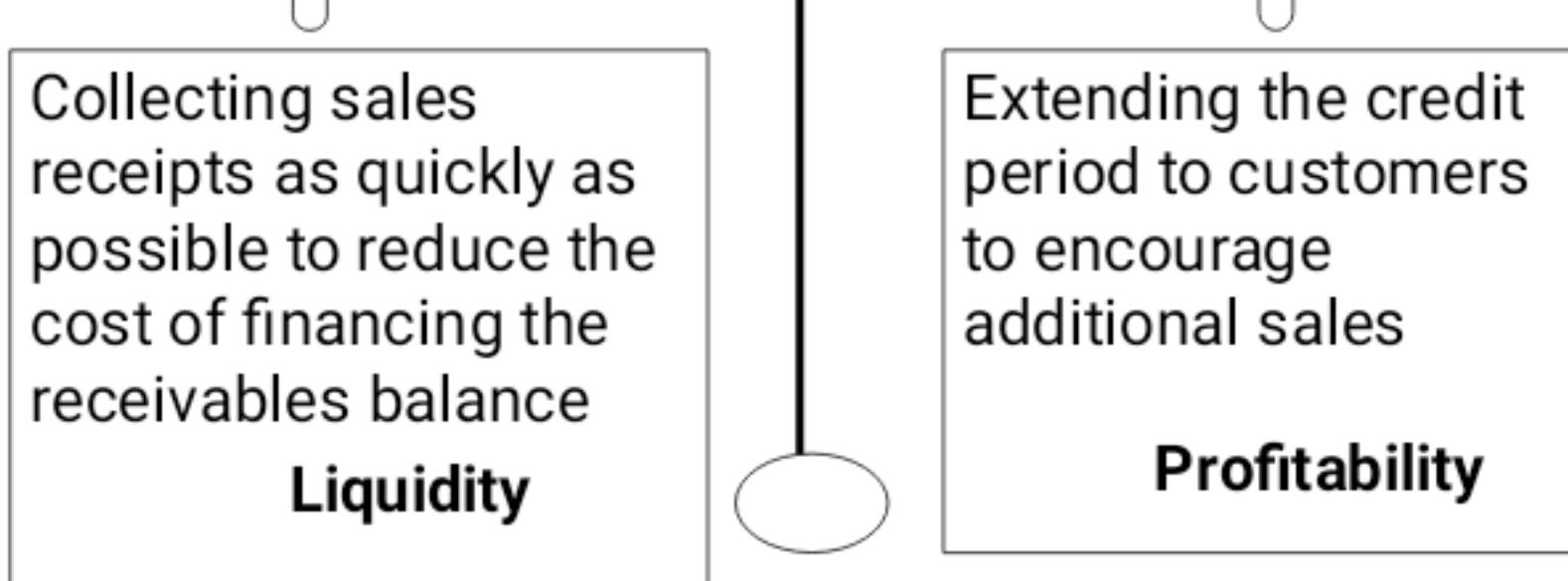
- § More bad debts
- § Higher collection costs
- § More discount expenses
- § Higher receivables
- § Longer collections
- § More interest expense

Strict Management:

Less sales and gross margin, but

- § Less bad debts
- § Lower collection costs
- § Less discount expenses
- § Lower receivables
- § Shorter collections
- § Less interest expense

Receivables balancing act



This trade-off is a key factor in determining the company's working capital investment.

2. Establishing a Payment Period

- ◆ Companies should determine a required payment period and communicate that policy to their customers.
- ◆ The payment period should be consistent with that of competitors.

3. Monitoring Collections

- ◆ Companies should prepare an accounts receivable aging schedule at least monthly.
- ◆ Treasurer should prepare a cash budget.
- ◆ Significant concentrations of credit risk must be discussed in the notes to its financial statements.

Aging the accounts receivable –

Customer balances are classified by the length of time they have been unpaid.

Customer	Total	Not Yet Due	Number of Days Past Due			
			1–30	31–60	61–90	Over 90
T. E. Adert	\$ 600		\$ 300		\$ 200	\$ 100
R. C. Bortz	300	\$ 300				
B. A. Carl	450		200	\$ 250		
O. L. Diker	700	500			200	
T. O. Ebbet	600			300		300
Others	36,950	26,200	5,200	2,450	1,600	1,500
	\$39,600	\$27,000	\$5,700	\$3,000	\$2,000	\$1,900
Estimated percentage uncollectible		2%	4%	10%	20%	40%
Total estimated uncollectible accounts	\$ 2,228	\$ 540	\$ 228	\$ 300	\$ 400	\$ 760

By analyzing accounts receivable aging, businesses can assess their cash flow, identify slow-paying customers, and prioritize collection efforts. This helps improve overall financial health and minimize the risk of bad debts.

4. Evaluating Liquidity of Receivables

$$\text{Receivables Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Net Receivables}}$$

$$\text{Average Collection Period} = \frac{365}{\text{Receivables Turnover Ratio}}$$

Ratio	McKesson (\$ in millions)	Cardinal Health	Industry Average
	2009	2008	2009
Receivables turnover	$\frac{\$106,632}{(\$7,774 + \$7,213)/2} = 14.2 \text{ times}$	14.8 times	18.7 times
Average collection period	$\frac{365 \text{ days}}{14.2} = 25.7 \text{ days}$	24.7 days	19.5 days

Accounts Receivable Turnover:

- ◆ Assess the liquidity of the receivables.
- ◆ Measure the number of times, on average, a company collects receivables during the period.

Average collection period:

- ◆ Used to assess effectiveness of credit and collection policies.
- ◆ Collection period should not exceed credit term period.

5. Accelerating Cash Receipts

Three reasons for the sale of receivables/ Factoring:

- a. Size.
- b. Companies may sell receivables because they may be the only reasonable source of cash.
- c. Billing and collection are often time-consuming and costly.

B. Managing Accounts Receivable(Cont'd):

- The objective of receivable management is **to promote sales and profit** until that point is reached where the return on investment in further funding receivables is less than the cost of funds raised to finance that additional credit.
- The costs associated with the extension of credit and accounts receivables are : **Collection Cost, Capital Cost, Administrative Cost and Default Cost.**

- (a) **Collection Cost:** this cost incurred in collecting the receivables from the customers to whom credit sales have been made.
- (b) **Capital Cost:** this is the cost on the use of additional capital to support credit sales which alternatively could have been employed elsewhere.
- (c) **Administrative Cost:** this is an additional administrative cost for maintaining account receivable in the form of salaries to the staff kept for maintaining accounting records relating to customers, cost of investigation etc.
- (d) **Default Cost:** Default costs are the over dues that cannot be recovered. Business concern may not be able to recover the over dues because of the inability of the customers.

Example 1: a company has sales of \$20 million for the previous year, receivables at the year end were \$4 million, and the cost of financing receivables is covered by an overdraft at the interest rate of 12% per annum.

- a) Determine the receivables days
- b) Determine the annual cost of financing receivables

Answer:

- c) Receivables days = $(\$4 \text{ million}/\$20 \text{ million}) \times 365 = 73 \text{ days}$
- d) Cost of financing receivables = $\$4 \text{ million} \times 12\% = \$480,000$

Example 2:

The actual sales and forecast of a firm are shown below:
(Value in Frw)

Actual Sales	Amount	Forecast	Amount
November 2016	500,000	January 2017	550,000
December 2016	600,000	February 2017	660,000
		March 2017	700,000
		April 2017	1000,000

actual experience shows that 80% of debtors are realized after one month and 20% after two months after goods are sold.

Required: You are requested to calculate sales receipts for Jan., Feb., March and April for the year 2017.

ITEM	Actual Sales			Forecast 2017		
	Nov. 2016	Dec. 2016	Jan. 2017	Feb. 2017	March 2017	April 2017
Total Sales	500,000	600,000	550,000	660,000	700,000	1,000,000
Credit Sales 80%	400,000	480,000	440,000	528,000	560,000	800,000
Collections						
- One Month	-	320,000	384,000	352,000	422,400	448,000
- Two Months	-	-	80,000	96,000	88,000	105,600
Total Collections			464,000	448,000	510,400	553,600
Cash Sales			110,000	132,000	140,000	200,000
Total Sales			574,000	580,000	650,400	753,600

Early settlement discounts

- Cash discounts are given to encourage early payment by customers. The cost of the discount is balanced against the savings the company receives from having less capital tied up due to a lower receivables balance and a shorter average collection period. Discounts may also reduce the number of irrevocable debts.

Exercise 1:

A company has sales of \$20 million for the previous year, receivables at the year end of \$4 million and the cost of financing receivables is covered by an overdraft at the interest rate of 12% per year. It is now considering offering a cash discount of 2% for payment of debts within 10 days.

Should it be introduced if 40% of customers will take up the discount?

Exercise 2:

Prepare an estimate of working capital requirement from the following information of a trading concern.

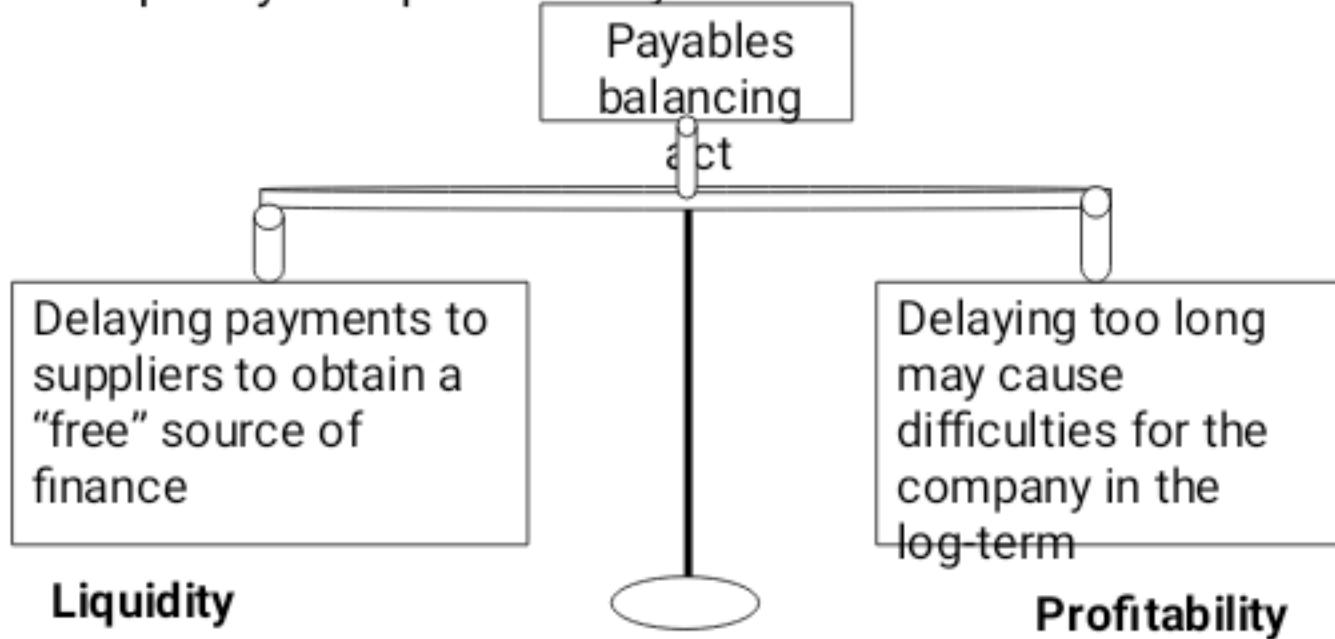
- Projected annual sales: 10,000 units
- Selling price: \$ 10 per unit
- Percentage of net profit on sales: 20%
- Average credit period allowed to customers: 8 Weeks
- Average credit period allowed by suppliers: 4 Weeks
- Average stock holding in terms of sales requirements: 12 Weeks
- Allow 10% for contingencies

Exercise 3: A manager desires to purchase a business and has consulted you and one point on which you are to advise him/her is the average amount of working capital which will be required in the first year's working. You have been given the following estimates and instructed to add 10% to your computed figure to allow for contingencies.

(i) Amount blocked up for stocks:	Figures for the year (\$)
Stocks of finished product	3,000
Stocks of stores, materials, etc.,	5,000
(ii) Average credit given:	
Local sales 4 weeks credit	26,000
Export sales - 1.5 weeks credit	65,000
(iii) Lag in payment of wages and other outputs	
Wages - 1.5 weeks	240,000
Stocks of materials, etc - 1.5 month	36,000
Rent, Royalties, etc. - 4 months	8,000
Clerical staff - 1.5 month	60,000
Manager - 0.5 month	4,000
Miscellaneous expenses - 1.5 month	36,000

C. Accounts Payable

- Trade credit is the simplest and most important source of short-term finance for many companies. Again, it is a balancing act between liquidity and profitability



By delaying payments to suppliers, companies face possible problems:

- Supplier may refuse to supply in future
- Supplier may only supply on a cash basis
- There may be loss of reputation
- Supplier may increase price in future

Test Your Knowledge

A company has recently recorded an increase in its Cash Conversion Cycle from 45 days to 70 days. Analyze the potential factors (**Internal and External**) that could have contributed to this increase and evaluate the implications this might have on the company's liquidity and operational efficiency. Furthermore, propose a detailed strategy to improve the Cash Conversion Cycle, and discuss the potential risks associated with your proposed strategies."

D. Cash Management

(1) Reasons of holding cash:

- **Transactions demand** need money to pay bills (employees, suppliers, utility/phone, etc.)
- **Precautionary demand**: to handle emergencies (unforeseen expenses)
- **Speculative demand**: to take advantage of unexpected opportunities (purchase of raw materials that are on sale)

(2) Objectives of cash management:

- Cash doesn't earn a return
- Want to maintain **liquidity**
- Good cash management implies maintaining adequate liquidity with minimum cash in bank
- Can place portion of cash balance into **marketable securities(cash equivalent)**: Examples include **Treasury bills, commercial paper, bankers' acceptances** (Short-term promissory notes issued by a firm and **accepted ((or guaranteed) by a bank)**)

D. Cash Management(Cont'd):

(3) Cash management models

Cash management models are aimed at minimizing the total costs associated with movements between:

- A current account (very liquid but not earning interest) and
- Short-term investments (less liquid but earning interest)

a) The Baumol cash management model:

- Baumol noted that cash balances are very similar to inventory levels, and developed a model based on the economic order quantity (EOQ):
- Assumptions:
 - Cash use is steady and predictable
 - Cash inflows are known and regular
 - Day-to-day needs are funded from current account

- The formula calculates the amount of funds to inject into the current account or to transfer into short-term investments at one time:

$$Q = \sqrt{\frac{2C_o D}{C_H}}$$

C_o= transaction cost, **D** = the demand for cash over the period relates to cash needs for day-to-day transactions, **C_H** = the cost of holding cash will be the opportunity cost relating to either the return it could have earned in marketable securities or deposit accounts or the cost of borrowing in order to acquire cash

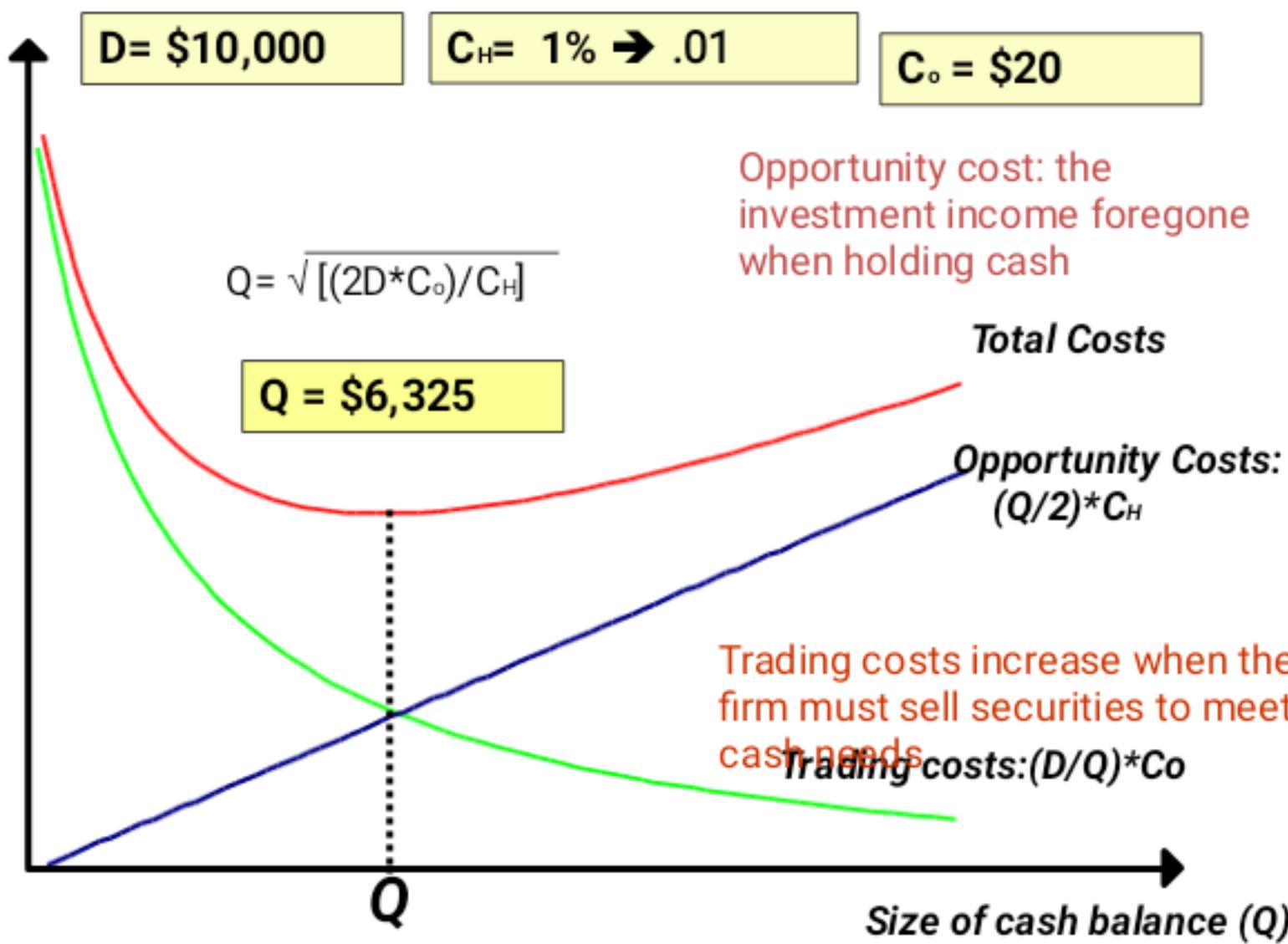
Example

Assume a company has the following financial characteristics:

- **Annual Cash Requirement (D):** The company needs \$10,000 in cash for its operations over the year.
- **Transaction Costs:** The company incurs a fixed cost of \$20 every time it buys marketable securities or sells them to convert them into cash.
- **Holding/ carrying cost (Interest Rate on Marketable Securities) (i):** The company can earn 1% interest on its marketable securities.
- The company wants to find the **optimal cash balance (C*)** to minimize its total cost of managing cash.

D. Cash Management(Cont'd): Optimal Cash Balance via Baumol Model

50000000 1002 504 339.333333 258 210



Interpretation

- § The company should maintain an **optimal cash balance of \$6,325** at all times. This means that the company will need to replenish its cash balance approximately every time it falls to this amount.
- § **How Often Should the Company Replenish its Cash?**

To find out how often the company will need to replenish its cash, we can calculate how many times per year the company will make a transaction (i.e., sell securities to raise cash):

The company needs \$10,000 annually and will withdraw \$6,325 each time it replenishes its cash.

The number of replenishments required per year is:

$10,000/6,325 \approx 1.58$ times. This is approximately **2 times per year**.

§ Total Costs:

Now, let's calculate the **total costs** associated with cash management under this optimal strategy:

Transaction Costs: Each time the company replenishes its cash, it incurs a transaction cost of \$20. Since it will make 2 transactions per year, the total transaction cost is:

$$1.58 \times 20 = 31.6 \text{ dollars}$$

Opportunity Costs: The opportunity cost is the interest the company could have earned by investing its excess cash. On average, the company holds half of its optimal cash balance in cash, which is \$3,163 ($\$6,325/2$). The opportunity cost is calculated as:

$$\text{Opportunity Cost} = \$3,163 \times 0.01 = \$31.6 \text{ dollars}$$

Total Cost: The total cost of cash management will be the sum of the transaction cost and the opportunity cost:

$$\text{Total Cost} = 31.6 + 31.6 = 63.2 \text{ dollars per year}$$

D. Cash Management(Cont'd):

Exercise:

A company generates \$10,000 per month excess cash, which it intends to invest in short-term securities. The interest rate it can expect to earn on its investment is 5% per annum. The transaction costs associated with each separate investment of funds is constant at \$50.

- a) What is the optimum amount of cash to be invested in each transaction?
- b) How many transactions will arise each year?
- c) What is the cost of making those transactions per year?
- d) What is the opportunity cost of holding cash per year?

D. Cash Management(Cont'd):

b) The Miller-Orr cash management model:

- The miller-Orr model controls **irregular movements of cash** by the setting **of upper and lower control limits on cash balances**. The Miller-Orr model is used for setting the target cash balance. It has the advantage of incorporating uncertainty in the cash inflows and outflows.
- **The lower limit** is specified by the firm and the **upper limit is calculated by the model**. The cash balance of the firm is allowed to vary freely between the two limits but if the cash balance on any day goes outside these limits, action must be taken.
- If the cash balance reaches the lower limit it must be replenished in some way, e.g. by the sale of marketable securities or withdrawal from a deposit account. The size of this withdrawal is the amount required to take the balance back to the return point.
- If the cash balance reaches the upper limit, an amount must be invested in marketable securities or placed in a deposit account, sufficient to reduce the balance back to the return point.

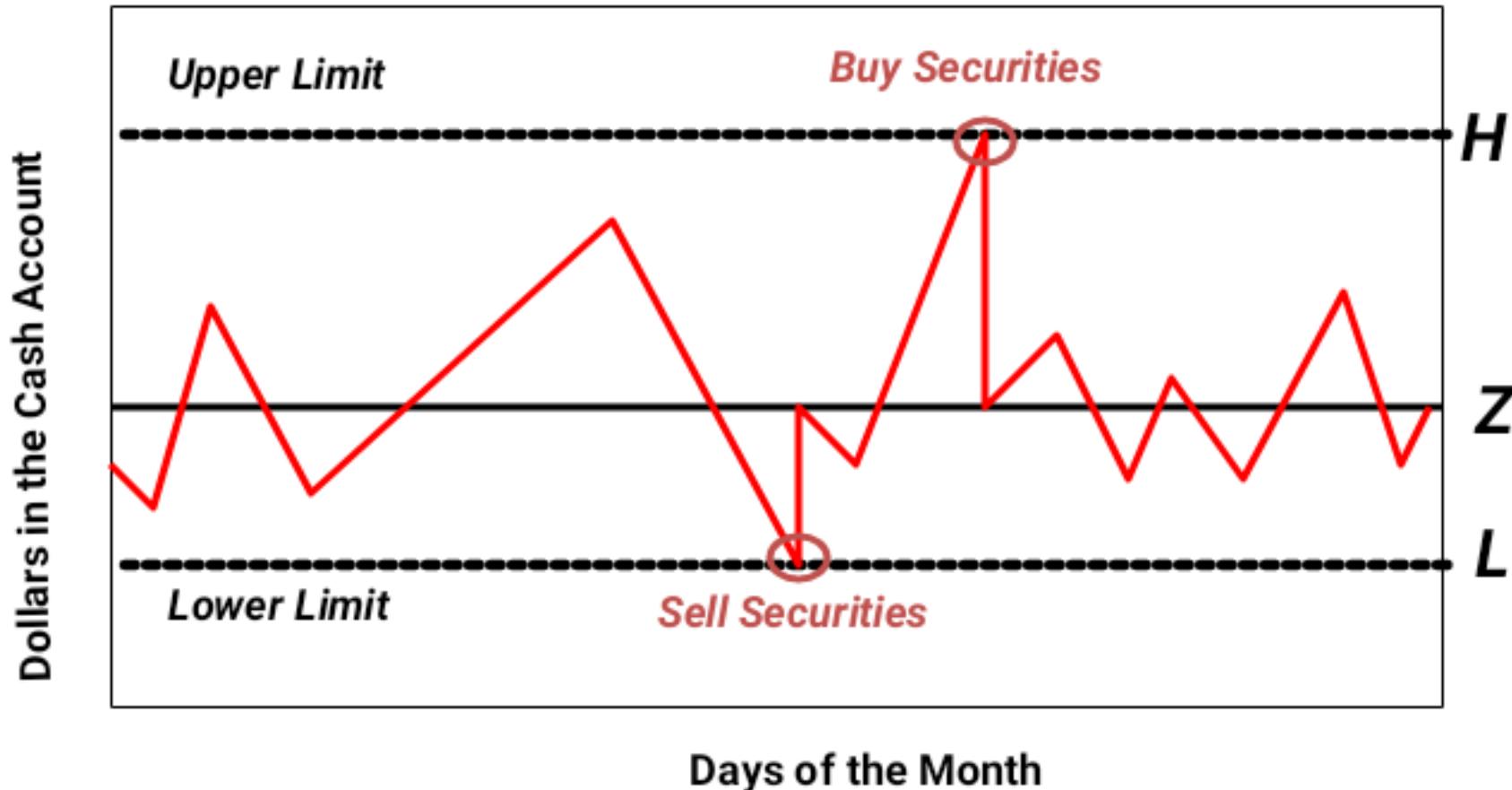
D. Cash Management(Cont'd):

The Miller-Orr cash management model:

- The Miller-Orr Model provides a formula for determining the optimum cash balance (Z), the point at which to sell securities to raise cash (lower limit L) and when to invest excess cash by buying securities and lowering cash holdings (upper limit H).
- Depends on:
 - transaction costs of buying or selling securities
 - variability of daily cash (incorporates uncertainty)
 - return on short-term investments

D. Cash Management(Cont'd):

The Miller - Orr Model



D. Cash Management(Cont'd):

The Miller-Orr Model
- Target Cash Balance (Z)

$$Z = \sqrt[3]{\frac{3 \times TC \times V}{4 \times r}} + L$$

where:
TC = transaction cost of buying or selling securities
V = variance of daily cash flows
r = daily return on short-term investments/interest rate
L = minimum cash requirement

D. Cash Management(Cont'd):

The Miller-Orr Model: Target Cash Balance (Z)

- **Example:** Suppose that short-term securities yield 0.05% per year and it costs the organization \$50 each time it buys or sells securities (TC). The daily variance of cash flows is \$1000 (V) and your bank requires \$1,000 minimum checking account balance (L).*

$$Z = \sqrt{\frac{3 \times 50 \times 1000}{4 \times .05/360}} + \$1,000$$

$$Z = \$3,000 + \$1,000 = \$4,000$$

- The upper limit for the cash account (H) is determined by the equation:

$$H = 3Z - 2L$$

where:

- Z = Target cash balance

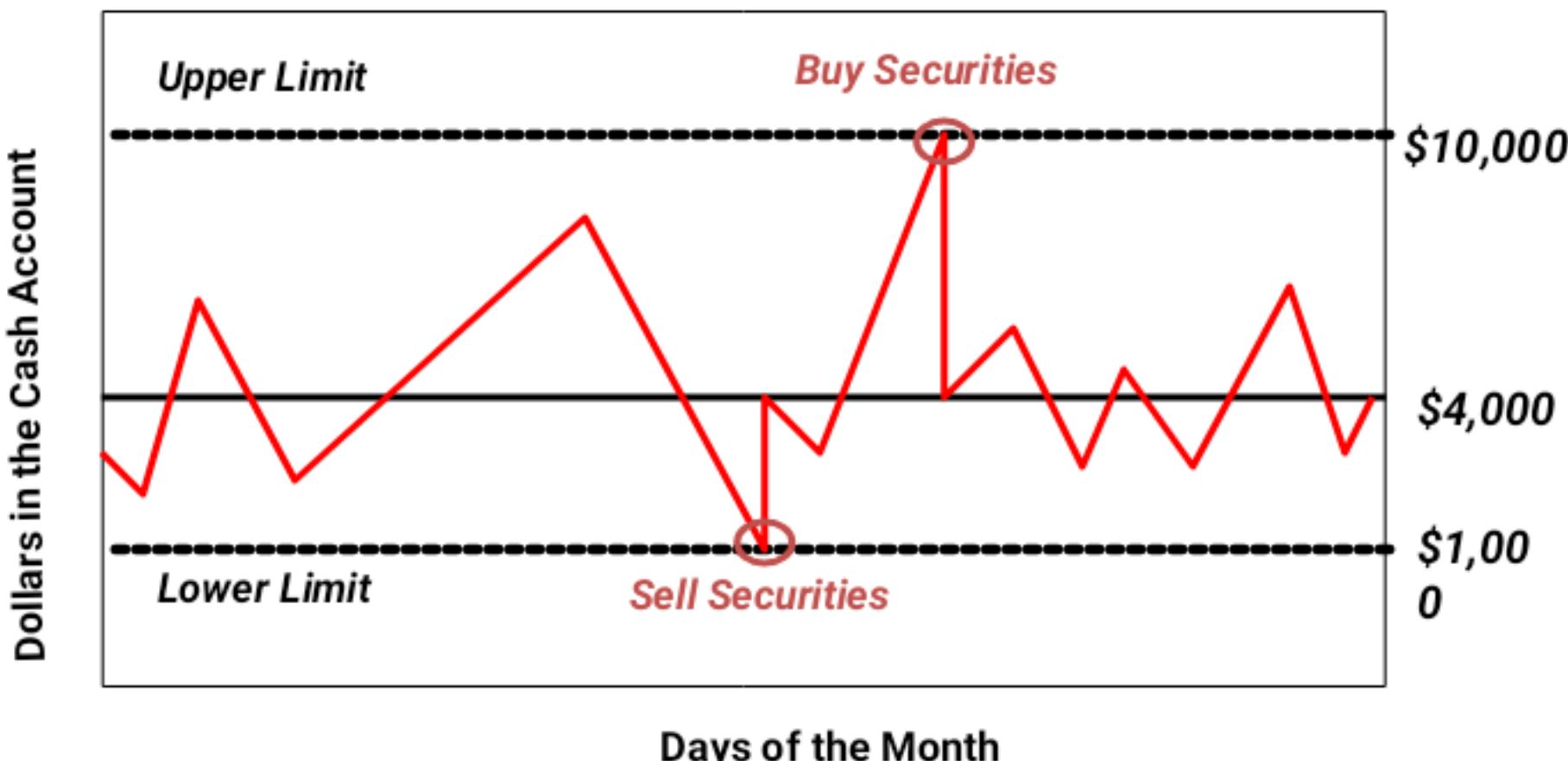
L = Lower limit

- In the previous example:

$$H = 3 (\$4,000) - 2(\$1,000) = \mathbf{\$10,000}$$

D. Cash Management(Cont'd):

The Miller - Orr Model



D. Cash Management(Cont'd):

The Miller - Orr Model

Exercise:

A company sets its minimum cash balance at \$20,000.

Transferring money to or from the bank costs \$50 per transaction. Inspection of daily cash flows over the past year suggests that the standard deviation is \$3,000. The interest rate is 0.03% per day.

Determine:

- a) The spread between the upper and lower limit
- b) The upper limit
- c) The return point