



# College of Engineering and Technology Department of Construction Technology and Management

Course: Financial Management of Construction

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# **CHAPTER 5**

## **Working Capital Management**

### **■ Working Capital**

- A firm's investment in short-term assets – cash, marketable securities, inventory, and accounts receivable.**
- All the short term assets used in daily operations.**

# Basic Definitions and Concepts

- **Gross Working Capital (WC):** Total current assets used in operations.
- **Net Working Capital:** Current assets – Current liabilities.
- **Working Capital Policy:** basic policy decisions as to
  - (1) the level of each type of current asset, and
  - (2) how current assets will be financed.
- **Working Capital Management:** Controlling cash, inventories, and A/R, plus Short-Term liability management.
  - Setting the WC policy and carrying out the policy in day-to-day operations

## 5.1 Working Capital Policy

### Selected Ratios--ABC *plc.*

|                               | <u>ABC</u> | <u>Industry</u> |
|-------------------------------|------------|-----------------|
| Current                       | 1.75x      | 2.25x           |
| Quick                         | 0.83x      | 1.20x           |
| Debt/Assets                   | 58.76%     | 50.00%          |
| Turnover of cash & securities | 16.67x     | 22.22x          |
| DSO (days)                    | 45.00      | 32.00           |
| Inv. turnover                 | 4.82x      | 7.00x           |
| F. A. turnover                | 11.35x     | 12.00x          |
| T. A. turnover                | 2.08x      | 3.00x           |
| Profit margin                 | 2.07%      | 3.50%           |
| ROE                           | 10.45%     | 21.00%          |

ABC appears to have large amounts of working capital given its level of sales.

## How does ABC's working capital policy compare with the industry?

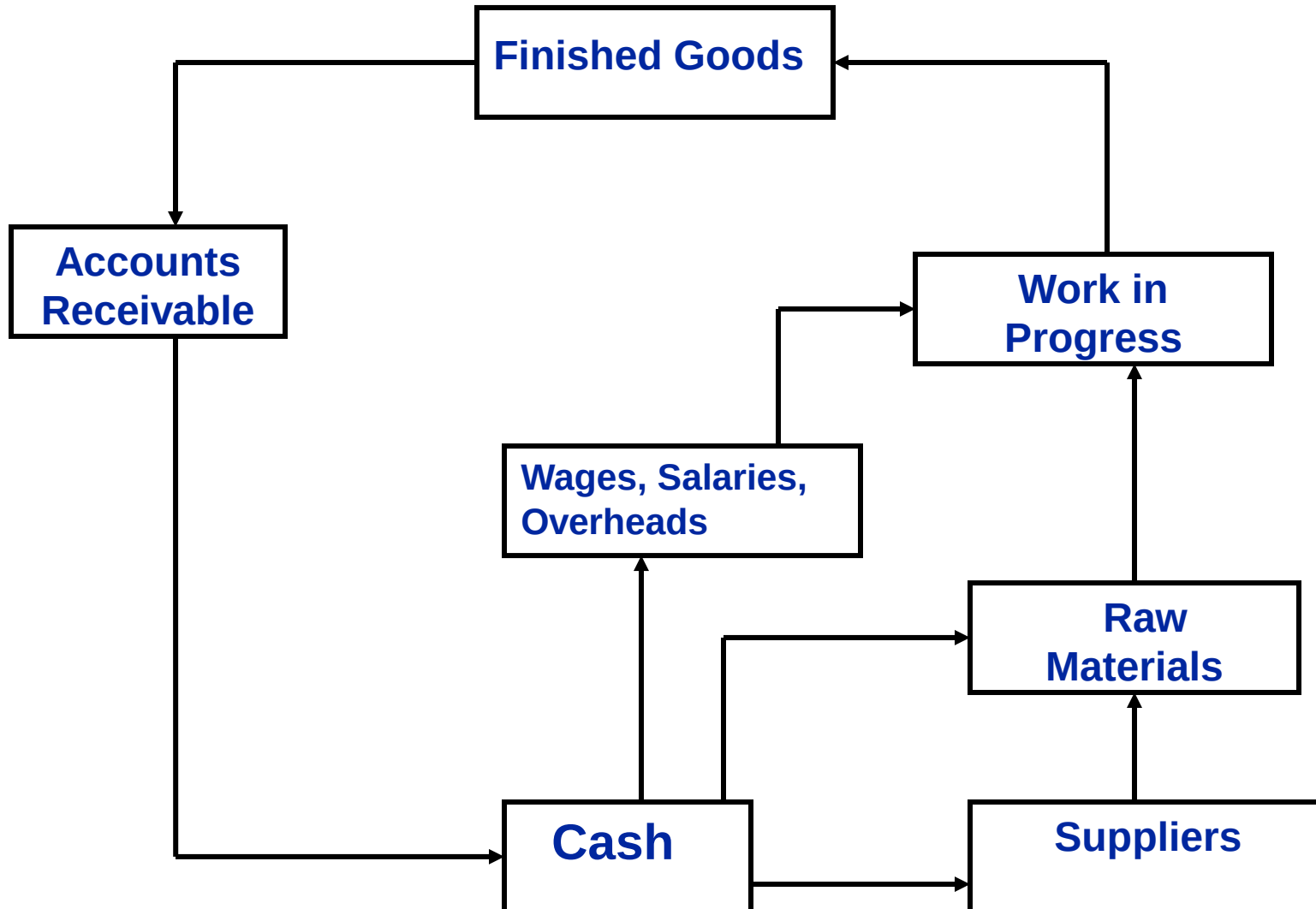
- Working capital policy is reflected in **current ratio, quick ratio, turnover of cash and securities, inventory turnover, and DSO.**
- These ratios indicate ABC has large amounts of working capital relative to its level of sales. ABC is either very conservative or inefficient.

## **Is ABC inefficient or just conservative?**

- **A conservative (relaxed) policy may be appropriate if it leads to greater profitability.**
- **However, ABC is not as profitable as the average firm in the industry. This suggests the company has excessive working capital.**

## 5.1.1 Characteristics of Current Assets

- Timing : short life span,
- Swift transformation into other asset

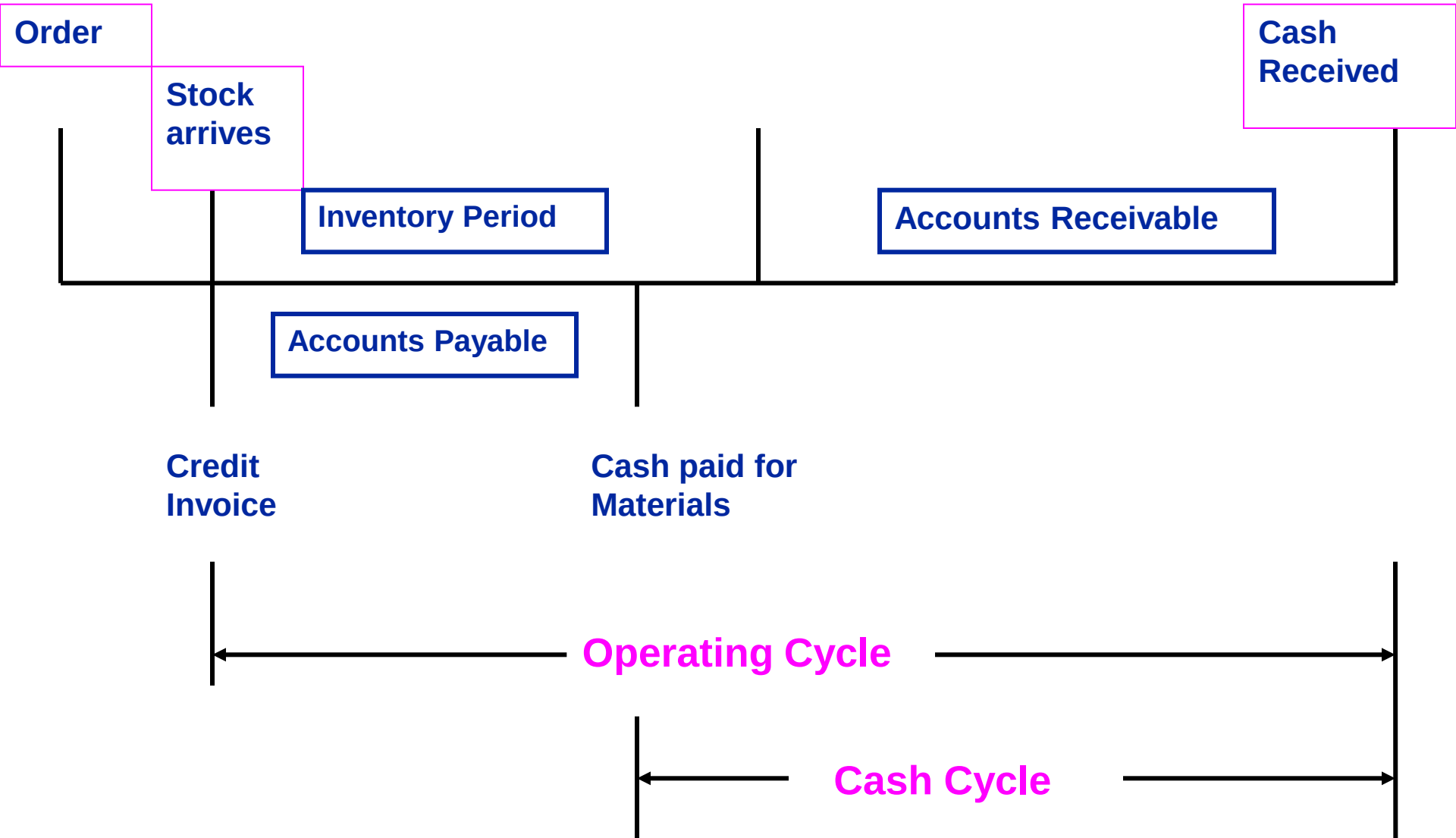


## **5.1.2 Operating Cycle and Cash Cycle**

**Investments in working capital are influenced by four key events in the production and sales cycle of the firm:**

- Purchase of raw materials,**
- Payment for raw materials,**
- Sale of finished goods**
- Collection of cash sales**

# Operating Cycle and Cash Cycle



### 5.1.3 Factors affecting WC Requirements

1. **Sales Volume:** some level of WC is required to support steady sales.
2. **Nature of business:** length of operating cycle
3. **Market condition:** Competition can guide WC policy (credit sales, stock levels)
4. **Conditions of Supply:** prompt and adequate supply lowers level of inventory and lead time (JIT).

## **5.1.4 Cash Requirement for WC**

**As a finance manager, one will be interested in figuring out how much cash to arrange to meet the working capital need of the firm.**

**Step 1. Estimation of the cash cost of various current assets required by the firm**

**Step 2. Deduct the current liabilities from the cash cost of current assets**

## 5.2 Cash and Liquid Management

All money items and sources that are immediately available to help pay a firm's bills

**Treasury bills:** unconditional promise by the government's treasury agent

**Commercial Paper:** short-term unsecured promissory notes issued by firms

**Certificate of Deposit:** represents a negotiable receipt of funds deposited in a bank for a fixed period

## 5.2.1 How large a cash balance is needed?

1. **Transaction needs:** A firm needs cash to carry out the day-to-day functions of the business
2. **Contingency needs:** For unexpected occurrences or emergencies that require cash
3. **Opportunity needs:** The chance to profit from having cash available

## 5.2.2 Forecasting Cash Flow

Determining the amounts and timing of future inflows and outlays of cash.

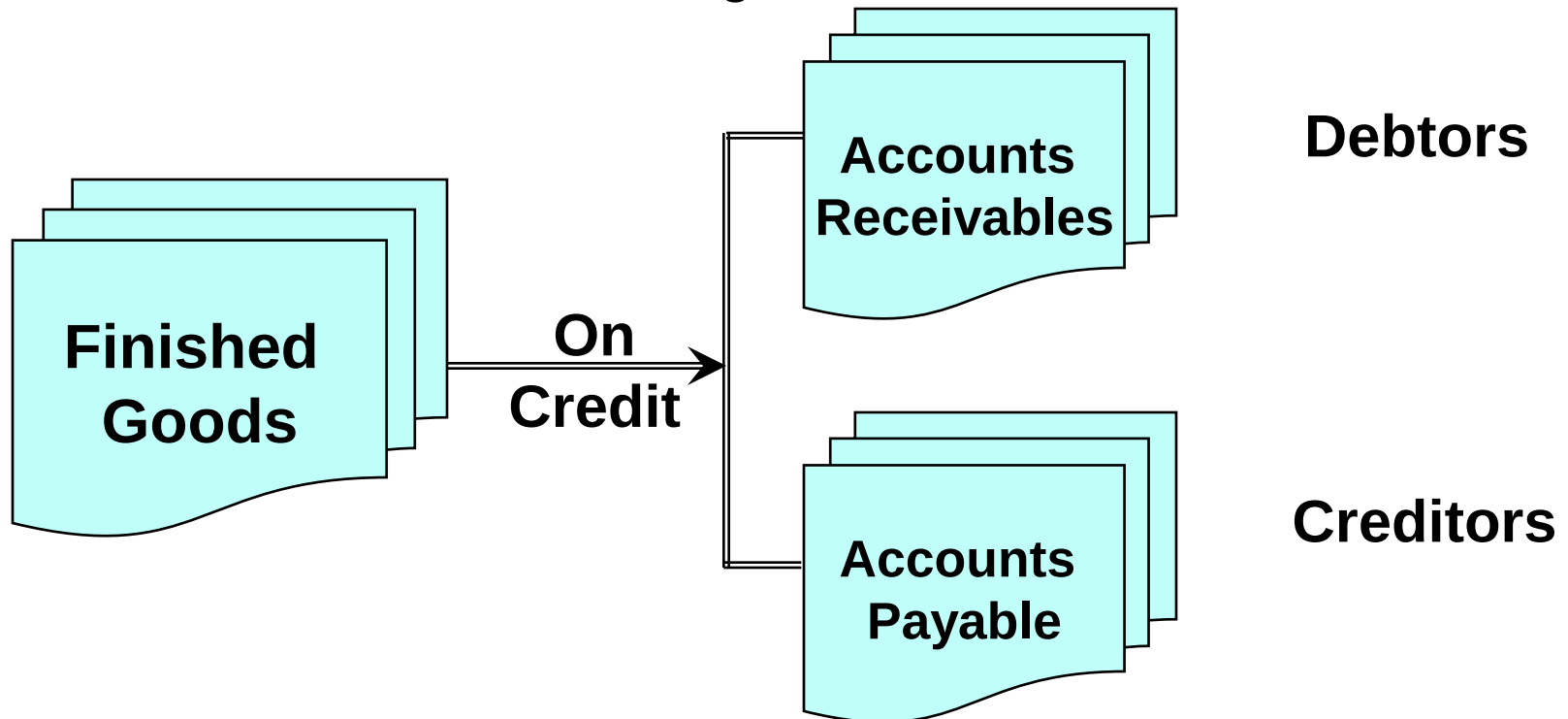
Failure of forecast casts risks such as:

1. **Default:** unable to pay interest or principal on borrowings
2. **Overdue bills:** failure to pay short term obligations (A/P)
3. **Lost savings on purchases:** loss of discounts on cash purchases

## 5.3 Credit Management

Why Credit?

1. **Competition:** causes firms to sell on credit to attract customers
2. **Facilitates Sales:** as it augments customers resources



## **5.3 Credit Management (cont'd)**

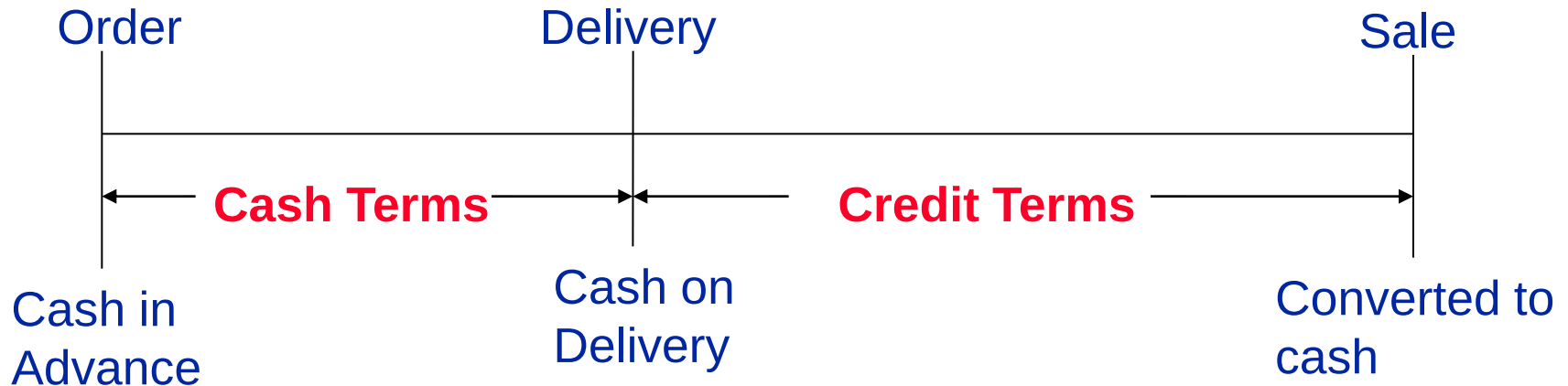
**Accounts Receivable makes a major component of a firms working Capital Needs,**

**Investment in A/R depends on:**

- 1. How much the firm sales on credit, and**
- 2. How long it takes to collect the receivables:**

## 5.3.1 Terms of Payment

Terms of payment vary widely in practice.



1. **Cash Terms-** typically used when goods are made to order
2. **Credit Terms**

## 5.3.1 Terms of Payment (Cont'd)

**Credit Terms can be:**

- i. **Open Account:** seller ships goods and sends the invoice
- ii. **Bill of Exchange:** a more secure arrangement that represents an unconditional order by the seller asking the buyer to pay on demand or at certain future date, the amount specified on it
- iii. **Consignment:** agent relationship between the seller and the buyer
- iv. **Letter of Credit:** issued by a bank on behalf of its customer to the seller.
  - **Lower Credit risk & uncertainty, safety to the buyer**

## **5.3.2 Costs of Maintaining Receivables**

**The willingness to allow credit sales involve certain costs :**

- i.    Financing the Receivables**
- ii.   Administrative and collection expenses**
- iii.   Bad Debt loss**

### 5.3.3 Policies for Managing Receivables

The firm should establish its receivable policies after carefully considering both the benefits and costs of different policies.

i. **Profit:** Costs (tied up, collection, bad debt, discounts) should be compared with additional sales as a consequence of a proposed policy

Degree of relaxing a policy as determined by residual income:

$$\Delta R = \Delta S(p) - \Delta S(r) - \Delta I(k)$$

ii. **Growth in Sales:** growth is so important aside from profits, it should be viewed as a separate factor in determining receivable policies

## 5.3.4 Credit Policy Variables

The credit policies have a bearing on the **level of sales, bad debt loss, discounts taken by customers, and collection expenses**. The important dimensions of credit policy are:

- i. **Credit Standards:** What standard should be applied in accepting or rejecting an account for credit granting? Can range from **Liberal to stiff credit policy ...**
- ii. **Credit Period:** Has a direct proportionality with sales
- iii. **Cash Discount:** Firms generally offer cash discounts to induce customers to make prompt payments.
- iv. **Collection Effort:** aimed at timely collection of the R & consists of:
  - Monitoring the state of receivables,
  - Dispatch of letters to customers whose due date is approaching,
  - Electronic and telephonic advice to customers around the due date,
  - Threat of legal action to overdue accounts,
  - Legal action against overdue accounts.

## 5.4 Inventory Management

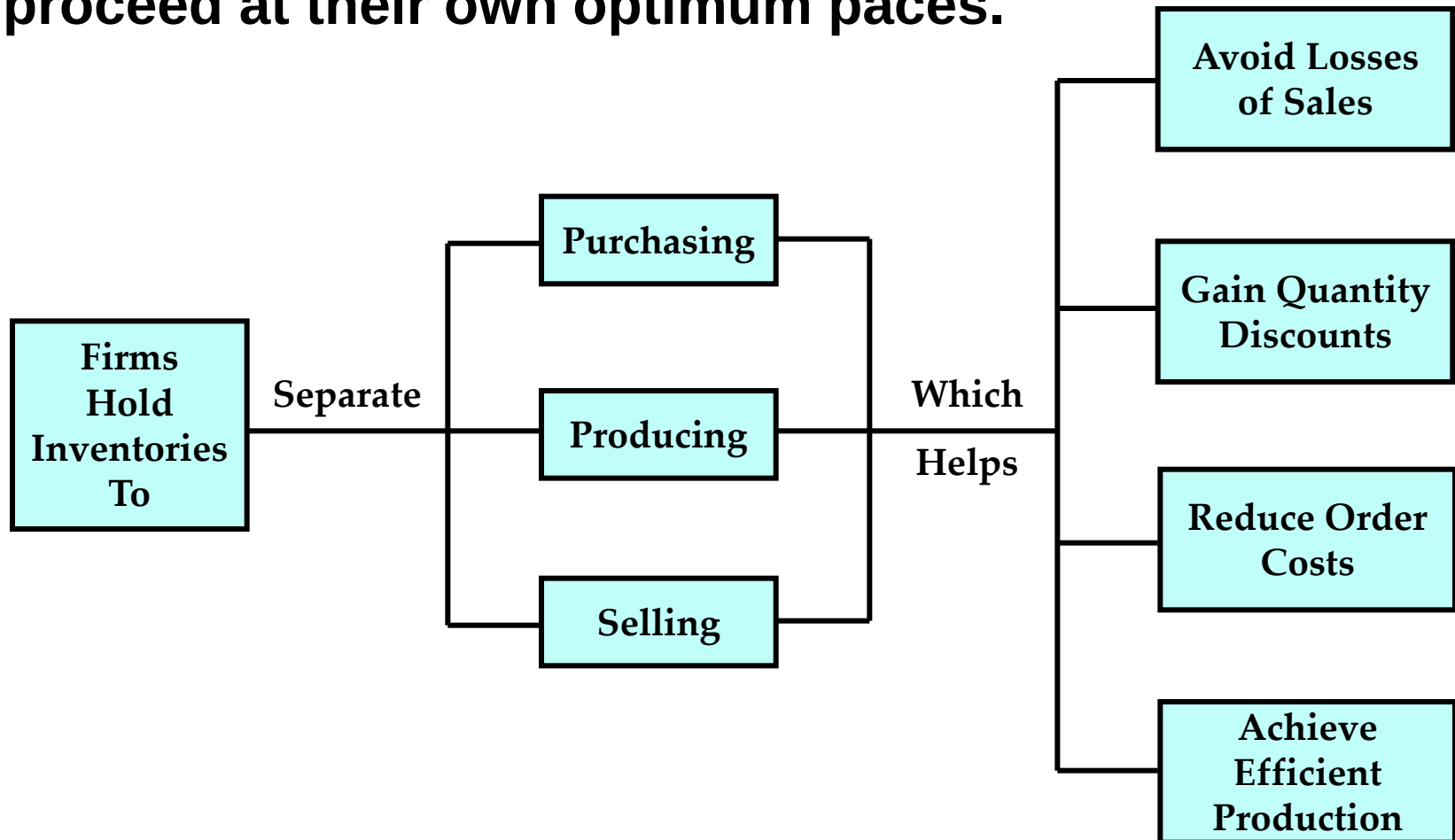
**Defn: Goods held for eventual resale by the firm.**

**Three types of inventories:**

- i. **Raw Materials**
- ii. **Goods in Process:** materials committed to the production process but have not been completed
- iii. **Finished Goods:** ready for sale. Final output of the production process. “Merchandise inventory”

## 5.4.1 Benefits of holding inventory

Inventories are used to provide **cushions** so that the purchasing, production, and sales functions can proceed at their own optimum paces.



## 5.4.1 Benefits of holding inventory (Cont'd)

- i. **Avoiding Losses of Sales:** Ability of a firm to give quick service and to provide prompt delivery is closely tied to the proper management of inventory
- ii. **Gaining Quantity Discounts:** to make bulk purchases of goods at large discounts. **The cost of maintaining the inventory however, should be less than the discount.**
- iii. **Reducing Order Costs:** Forms must be typed, checked, approved and mailed; when goods arrive, they must be accepted, inspected and counted.
- iv. **Achieving Efficient Production Runs:** If the firm has to change setups frequently, it would experience high unit costs of production.

## 5.4.2 Costs of holding inventory

The effective management of inventory involves a tradeoff between having too little and also too much inventory.

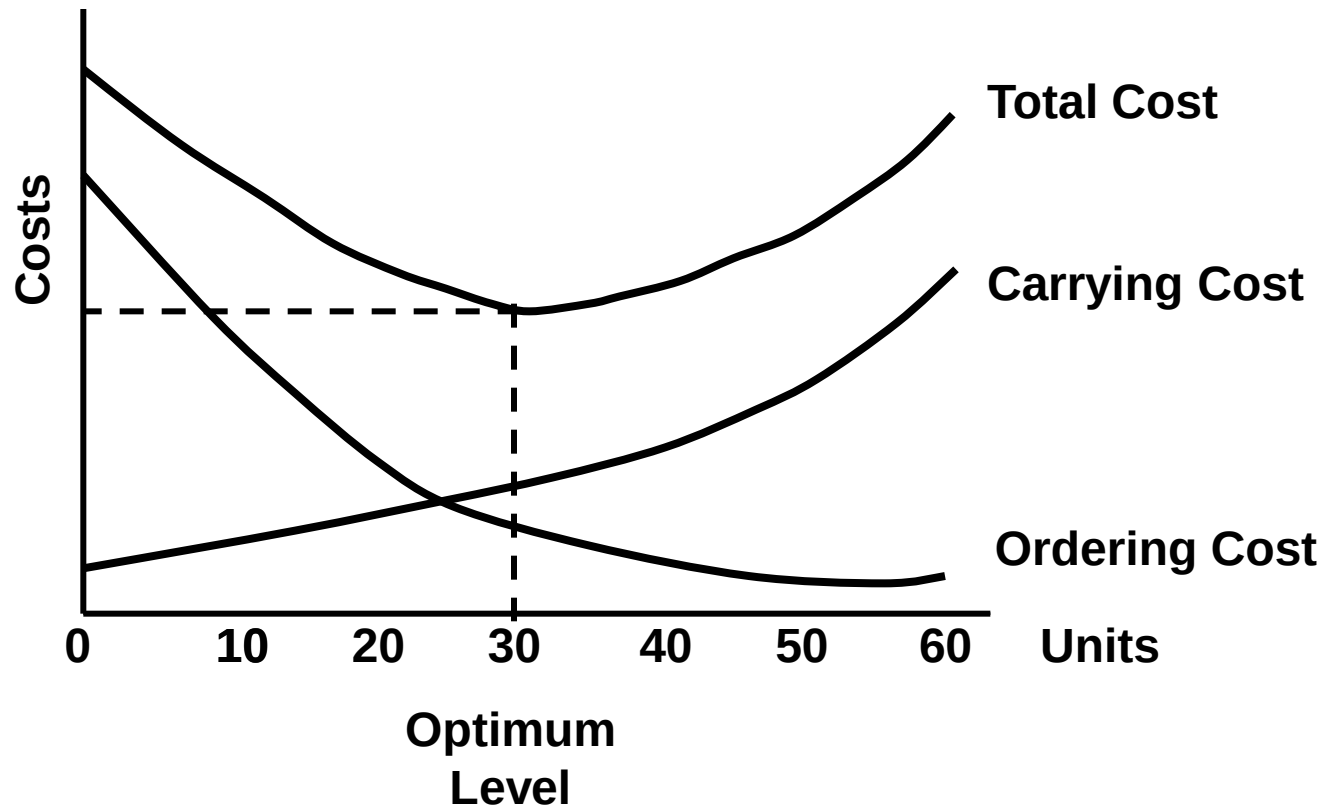
Inventory costs:

- i. **Ordering Costs:** requisitioning, preparation of purchase order, expediting, transport and receiving and placing in storage, set-up costs
- ii. **Carrying Costs:** interest on capital locked up in inventory, storage and handling costs, insurance, depreciation, and property taxes.
- iii. **Shortage Costs:** arise when inventories are short of requirement for meeting the needs of production or the demand of customers.
  - Loss of sales, loss of customer goodwill, disruption of production schedules.

### **5.4.3 Inventory Management – Minimizing Costs**

- **The goal of effective inventory management is to minimize the total costs that are associated with ordering and holding inventories.**
- **Choose the level of inventory with the lowest total cost after estimating the different expenses with varying inventory levels.**

## 5.4.3 Inventory Management – Minimizing Costs (Cont'd)



**The two basic questions relating to inventory mgt**

- **Size of the Order:**  $Q$  optimal
- **The Level to Order:**  $Q$  level

## i) Order Quantity

### Economic Order Quantity (EOQ)

- The Economic Order Quantity refers to the order size that will result in the lowest total of **order and carrying costs** for an item of inventory.
  - Order costs increase as number of orders increase
  - Carrying costs increase as large stocks are kept

#### Variables in the EOQ model:

- U: The forecast usage/demand for goods or raw materials for a year is known,
- Q: Quantity Ordered,
- F: Cost per Order,
- C: Percent Carrying Cost
- P: Price per Unit,
- TC: Total Costs of ordering and carrying

## i) Order Quantity

### Economic Order Quantity (EOQ)

$$TC = \frac{U}{Q}(F) + \frac{Q}{2}(P)(C)$$

The total cost of ordering and carrying is minimized when the derivative of the above equation is equated to zero:

$$\frac{dTC}{dQ} = -\frac{UF}{Q^2} + \frac{PC}{2} = 0 \quad Q^2 = \frac{2UF}{PC}$$

$$Q = \sqrt{\frac{2FU}{PC}}$$

## i) Order Quantity

### Economic Order Quantity (EOQ)

Example: Given the following for a company:

U= Annual sale= 20,000 Units

F= fixed cost per order = Birr 2,000

P= Purchase price per unit= Birr 12

C= Carrying cost = 25% of inventory value

$$Q = \sqrt{\frac{2FU}{PC}}$$

$$Q = \sqrt{\frac{2 \times 2,000 \times 20,000}{12 \times 0.25}} = 5,164 \text{ units}$$

## ii) Order Level Economic Order Quantity (EOQ)

■ If the usage rate of materials and lead time for procurement are known with certainty then;

**The ordering level = Lead time in days for procurement X Average daily usage**

*End of Chapter 5*