Inventory Management

Daw Khin Kant Kaw
BA(EPP), MBA
Assistant Teacher
Strategy First Institute

Definition of Inventory

- **Inventory** by definition refers to the stock of any item or resource used in an organization that can be in the following forms:
  - Raw materials
  - Work-in-process
  - Finished goods
  - Component parts
  - Supplies

Reasons for keeping Inventories

- *Pipeline:* Inventory on hand to minimize production delays.
- *Cycle:* Suppliers have minimum order amounts that are greater than immediate need.
- *Safety:* Stocks held to avoid a shortage because of uncertain production demands.
- *Speculative:* Items purchased to beat supplier price increases.

Cost to carry Inventory

- Unit material cost:
  - (Safe to stock more material to prevent shortage **but** will cost money to buy)
- Cost of Ordering them:
  - (Same overhead irrespective of volume ordered)
- Holding cost
  - (Rent of the store, insurance, warehouse admn.)

Holding Costs and Ordering Costs

- Average inventory= (Maximum inventory+ Minimum inventory)/2 = Q/2
- Annual holding costs= (Average Inventory) (Annual Holding Costs Per Unit)

$$= \tfrac{1}{2} QC_h$$

- Annual ordering costs= (Number of orders per year) (Costs per year) $= \frac{D}{Q} C_o$

Total Costs

- Total costs $TC = \frac{Q}{2} Ch + \frac{D}{Q} Co$

Balancing Act

- The optimal inventory level is a delicate balancing act **SINCE** holding high inventory means investment in material and labour or **money being tied up.**

The **Balancing Act** leads to Inventory Management

Inventory Management

- **Inventory Control**
- **Inventory Planning:**
  - When to Order – *Re-order point*
  - How much to Order – *Economic Order Quantity*

Inventory Control

- Inventory/stocks are held to make production possible even though demand fluctuates
- Inventory control should be under production control (or details should be available to production)
- Records on ledger cards or on computer should include stock level, opening and closing balance, reorder level, etc.

Three Types of Checking Stocks

- Annual stock taking
  - Vale stock at end of year, annually
  - Physically count the stock
- Spot check or audit
  - To detect losses (stolen, or other waste)
- Perpetual inventory
  - Ledger card is updated every time stock is issued or received
  - Stock level is known

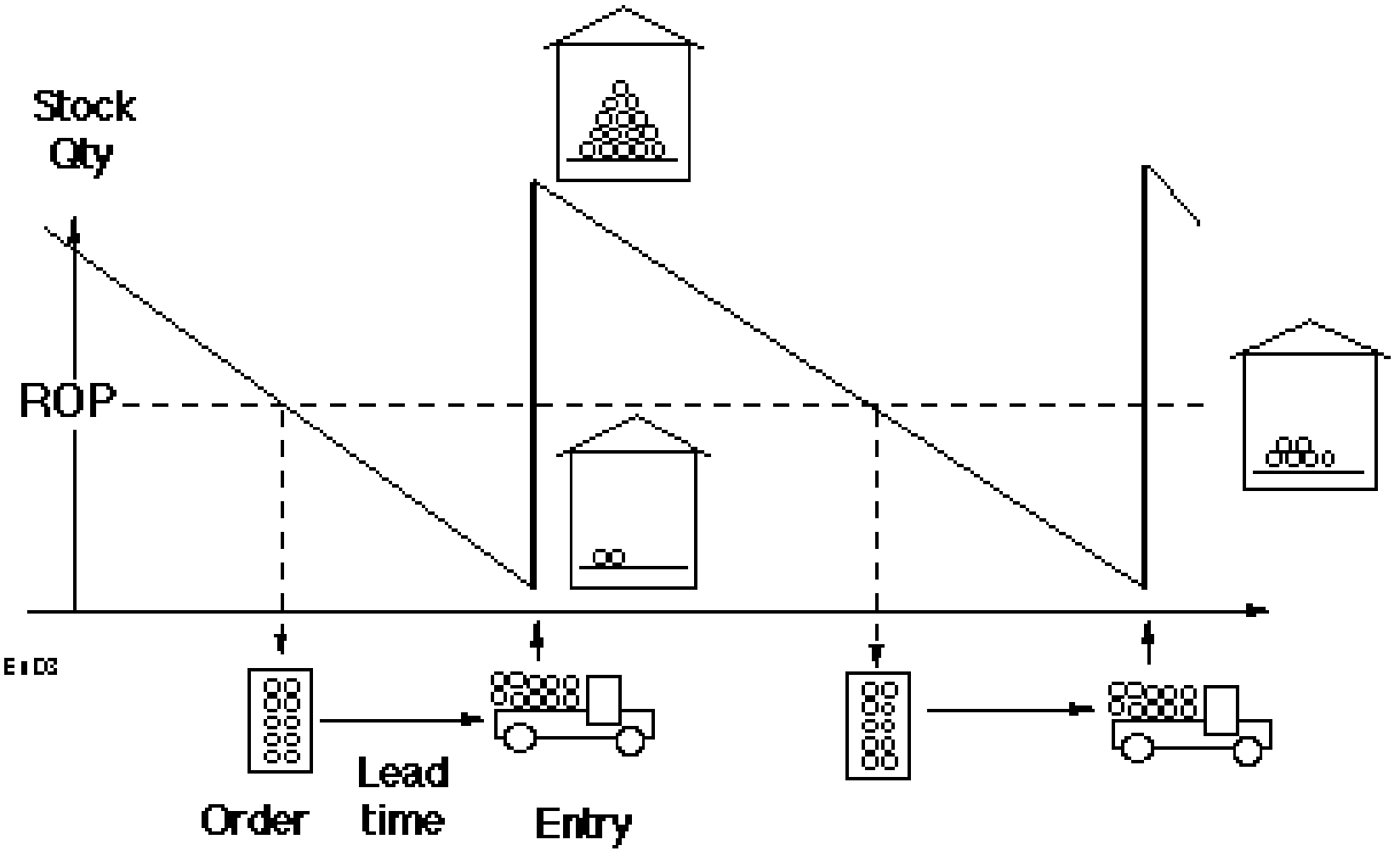
Re-order point

- Reorder level (or **reorder point**) is the inventory level at which a company would place a new order .

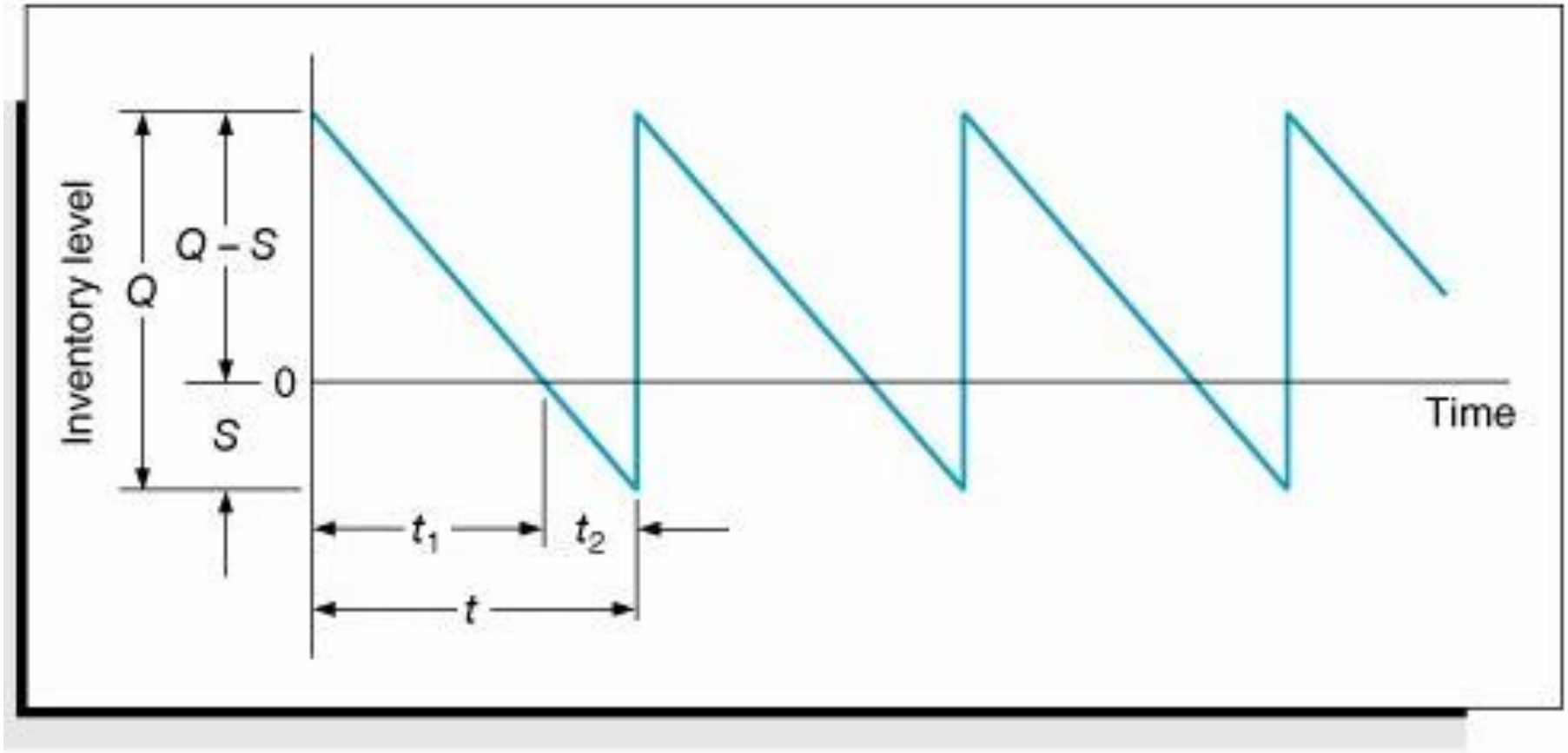
Reorder Level

=Lead Time (days) × Daily Average Usage + Safety Stock

  - Lead time is the time it takes the supplier to provide the ordered units.
  - Daily average usage is the number of units used each day.
  - If a business is holding a safety stock to act as buffer.


Stock
Qty
ROP
Order
Lead
time
Entry

Re-order point



Calculate

- ABC Ltd. is a retailer of footwear. It sells 500 units of one of a famous brand daily. Its supplier takes a week to deliver the order. ABC Ltd. has decided to hold a safety stock equivalent to average usage of 5 days.
- Calculate the re-order point.

Re-order Point

(lead time x daily usage) + safety stock

(7 X 500) + 2500

=6000

Economic Order Quantity (EOQ)

- Holding costs is sum of the costs of capital and variable costs of keeping items on hand (storage, handling, taxes, insurance, etc.)
- Ordering costs is cost of preparing an order

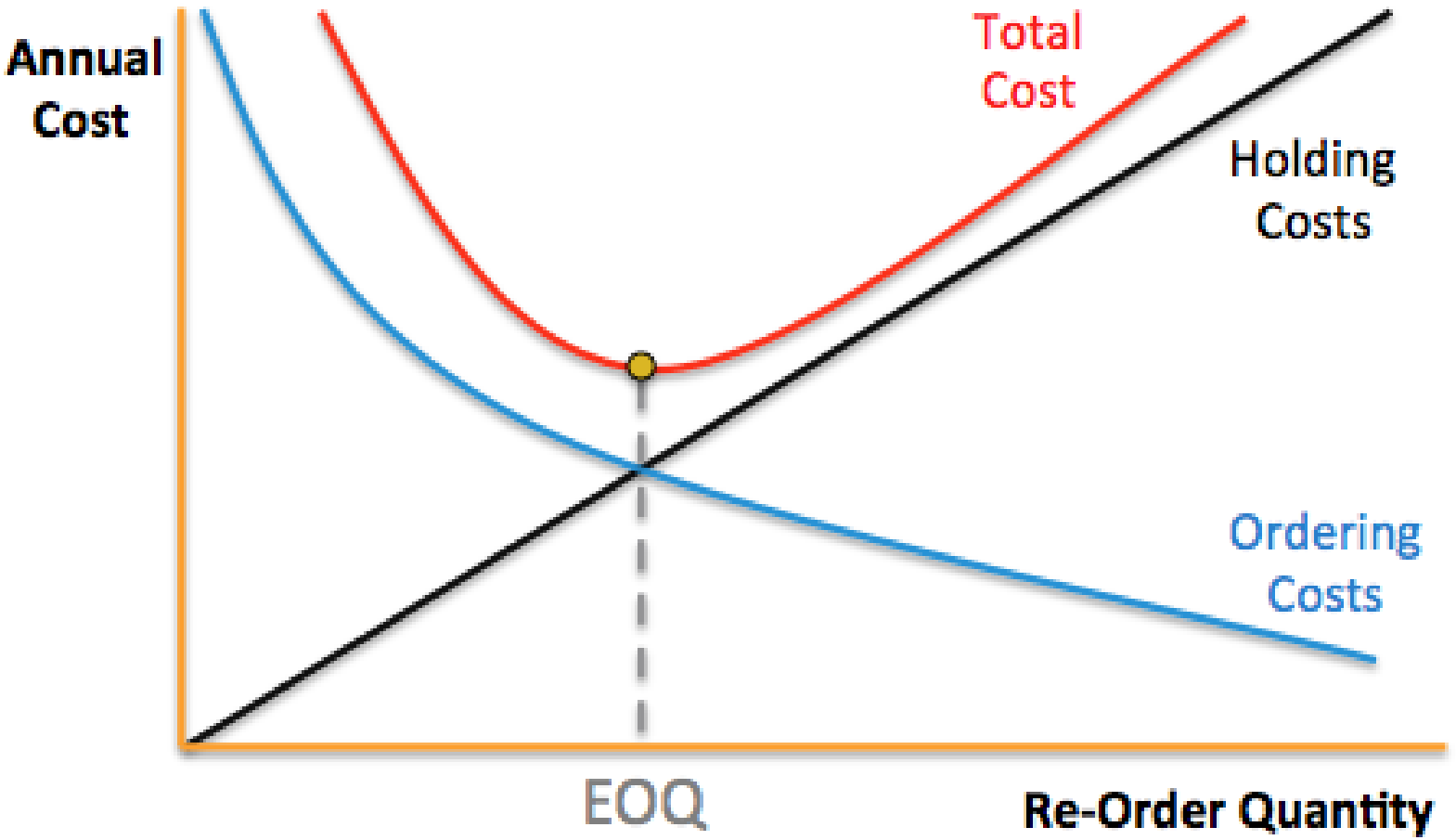
Assumptions of EOQ

- Demand rate is constant and known
- Only two relevant costs are holding cost and ordering costs
- Lead time is constant
- No combine effect can be achieved
- No constraints are placed on the size of order

Economic Order Quantity (EOQ)

- Quantity that minimizes the balance of costs between inventory/stock holding costs and ordering costs (reorder costs).
- Holding costs are low when reorder quantity is small and high when we buy larger volume.
- Reorder costs are high when reorder quantity is small, and cheaper when the reorder quantity is high.

EOQ Model


Annual Cost
Total Cost
Holding Costs
Ordering Costs
EOQ
Re-Order Quantity

$$EOQ = \sqrt{\frac{2(\text{Annual usage in units})(\text{Order cost})}{(\text{Annual carrying cost per unit})}}$$

$$Q^* = \sqrt{2DCo/Ch}$$

Calculate

- Annual Demand = 4500 units/year
- Holding cost per year = $3/year
- Order cost = $40/order

1. What is the EOQ for this product?
2. Calculate the total costs for Q*.

$$EOQ = \sqrt{(2(4500)\ 40/3}$$

$$= 346.4$$

$$= 346 \text{ Unit}$$

- Total costs $TC = \frac{Q}{2} Ch + \frac{D}{Q} C$

$$= (346/2) \times \$3 + (4500/346) \times \$40$$

$$= \$519 + \$519$$

$$= \$\ 1038$$

Methods of Charging stocks (Stock valuation)

1. FIFO (First In, First Out)
2. LIFO (Last In, First Out)
3. Simple average cost
4. Weighted average cost (WAC)
5. Standard cost
6. Replacement cost

Inventory Control – Why & How

- Have an optimal carrying cost (**EOQ)**
- Avoid shortages and lose customer goodwill (**Re-order point)**
- Avoid obsoleteness of inventories (**Inventory record keeping/ policy LIFO or FIFO)**
- Correct Asset valuation (**Inventory record keeping)**