

Relevant costs for quantitative models under conditions of certainty

1. Holding costs

- Opportunity cost of investment in stocks
- Incremental insurance costs
- Incremental warehouse and storage costs
- Incremental material handling costs
- Costs of deterioration and obsolete stocks

2. Ordering costs

- Incremental clerical costs of preparing a purchase order, receiving deliveries and paying invoices.

Quantity discounts (cont.) - Example

1. Purchase price of material = €7

Demand = 9,000 units

Holding cost = €4 per unit

Cost per order = €5

A quantity discount of 3% is available for orders in excess of 1,000 units.

2. $EOQ = \sqrt{\left(\frac{2 \times 9,000 \times 5}{4} \right)} = 150 \text{ units}$

Should the company adopt the order quantity of 1000 units?

Just-in-time systems

1. Elimination of non-value-added activities
 - Many activities add cost but no value to the product
 - The aim of JIT is to convert raw materials to finished products with lead times equal to processing times
2. Batch sizes of one
 - The aim is to reduce set-up times, batch sizes and throughput times, thus minimizing stocks
3. JIT purchasing arrangements
 - More frequent deliveries of material that immediately precede their use

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- A company plans to purchase 90,800 units.
- Item is purchased in boxes, each containing 10 units of the item. Price is £200 per box.
- Safety stock of 250 boxes is kept.
- Cost of holding an item in stock p.a. is 15% of purchase area.
- Cost of placing orders of €5,910 was incurred on 30 orders.
- Ordering costs change in proportion to no of orders placed. Add 2% to ordering costs to allow for inflation.
- **Required:** Calculate the order qty that would minimise the cost of the above item, and determine the required frequency of placing orders, assuming that usage of the item will be even over the year.