

Supplier Management - EOQ Models - Exercises

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1 Economic Order Quantity (EOQ) Models

In business management, particularly in supplier management, the EOQ model helps to calculate optimal order quantities to minimize inventory holding costs and ordering costs. The models analyze the relationship between order quantities, holding costs, production costs, and potential shortages.

Exercises

1. **EOQ I - Basic Model:** A company has a constant demand of 10,000 units per year, the ordering costs are 50 euros per order, and the holding costs are 2 euros per unit per year. Calculate the optimal order quantity and the number of orders per year.
2. **EOQ I - Basic Model:** A producer has an annual demand of 25,000 units. The holding cost per unit is 1.5 euros per year, and the fixed ordering cost is 100 euros per order. Calculate the optimal order quantity and the annual total cost (ordering and holding costs).
3. **EOQ I - Basic Model:** A retailer with a constant annual demand of 5,000 units has holding costs of 0.8 euros per unit and ordering costs of 40 euros per order. Determine the optimal order quantity and the ordering frequency.
4. **EOQ II - Backordering Model:** A company with an annual demand of 15,000 units has holding costs of 1.2 euros per unit and backordering costs of 4 euros per unit. The ordering costs are 60 euros. Calculate the optimal order quantity considering shortages (backordering).

5. **EOQ II - Backordering Model:** A firm has a constant demand of 12,000 units per year. The holding costs are 2 euros per unit, and the backordering costs are 3 euros per unit, while the ordering costs are 75 euros per order. Determine the optimal order quantity considering shortages.
6. **EOQ II - Backordering Model:** A company has an annual demand of 20,000 units. The holding costs per unit are 1.5 euros, the back-ordering costs are 5 euros per unit, and the ordering costs are 100 euros. Calculate the optimal order quantity and the optimal ordering frequency considering backordering.
7. **EOQ III - Production Model:** A company produces 40,000 units per year, the holding costs are 2 euros per unit, the production rate is 10,000 units per month, and the ordering costs per production run are 150 euros. Calculate the optimal production lot size and the average inventory level.
8. **EOQ III - Production Model:** A manufacturer has a production rate of 5,000 units per month and an annual demand of 50,000 units. The holding costs are 1.8 euros per unit, and the ordering costs per production run are 120 euros. Calculate the optimal lot size and the average inventory.
9. **EOQ III - Production Model:** A company produces 60,000 units annually with a monthly production rate of 12,000 units. The holding costs per unit are 2.5 euros, and the production run costs are 200 euros per run. Determine the optimal production lot size and the total costs.
10. **EOQ III - Production Model:** A manufacturer produces products at a rate of 30,000 units per year. The holding costs are 1.2 euros per unit, the production rate is 7,000 units per month, and the costs per production run are 100 euros. Calculate the optimal production lot size and the number of production runs per year.

2 Summary

Calculating the optimal order quantity using the EOQ models allows companies to minimize both inventory holding and ordering costs. These exercises help you understand and apply the different EOQ models for inventory management.