

Decision making models essay sample

[Business](#), [Management](#)



The Economic Order Quantity Model will allow an organization to determine the optimal volume of inventory to order at a given time. The EOQ model provides the most optimized approach to inventory ordering as it considers, demand, ordering cost, and holding costs; to develop the volume of inventory to be ordered to maintain to minimum annual cost (Render, 2012).

Equation:

Variables:

Q^* = optimal number to order

D = annual demand in units

C_o = ordering cost

C_h = holding cost

Process Description:

Q or Q^* meaning the optimal order of pieces per order, is equal to the square root of the equation of annual demand (D), multiplied by 2, then multiplied by the ordering cost (C_o), which is then divided by the holding cost (C_h). The end result of the equation provides the optimal order of pieces per order or Q^* . Company A:

Demand (D) = 670, 000 units per year

Ordering Costs (C_o) = \$320 per order

Per Unit Cost of inventory = \$375

Holding cost rate = 5. 5%

Holding cost (C_h) = \$375 (5. 5) = \$20. 62

*Holding cost is the per unit cost of inventory multiplied by the holding cost rate

Step 1: Input variables into the equation

Step 2: Follow mathematical order of operations: simplify and solve for

numerator $2(670000)(320) = 428800000 = 20795344.3258972$ Step 3:

Follow mathematical order of operations: Divide numerator by

denominator $428800000/20.62$

Step 4: Square roots your quotient and get your final result of the equation =

4560 Step 5: Round up to the nearest Unit to get you final answer. In order

to minimize total cost, the order size should be 4560 when company A orders new inventory.

B – B1. Economic Production Lot Model

The Economic Production Lot Model is a variation of the EOQ model that allows businesses to determine optimal replenishment lot size. This model provides the most optimized approach this form of ordering as it considers, demand, available production, ordering cost, set up costs, and holding costs to develop the volume of inventory to be ordered to maintain to minimum annual cost (Render, 2012). Equation:

Variables:

Q^* = optimal number to order

D = annual demand in units

P = annual available production per year

C_o = Production set up cost

C_h = holding cost

Process Description:

Q or Q* meaning the optimal lot size per order, is equal to the square root of the equation of annual demand (D), multiplied by 2, then multiplied by the Production set up cost (Co), which is then divided by the holding cost (Ch) times, demand (D) over production (P) subtracted by 1. The end result of the equation provides the optimal lot size order or Q*. Company B:

Demand (D) = 8, 710, 000 units per year

d = 23, 863

Production (P) = 148, 070, 000 units per year

p = 405, 671

Production Setup Cost (Co) = \$3750 per order

Per Unit Cost of inventory = \$190

Holding cost rate = 6. 5%

Holding cost (Ch) = \$190 (. 055) = \$10. 45

*Holding cost is the per unit cost of inventory multiplied by the holding cost rate

Step 1: Input variables into the equation

Step 2: Follow mathematical order of operations: simplify and solve for numerator and denominator; $2(390000)(425) = 331, 500, 000$; $11. 55(1-. 59) = 663357. 02175647$

Step 3: Follow mathematical order of operations: Divide numerator by denominator $331, 500, 000/10. 89 = 499. 73089773$ Step 4: Square roots your quotient and get your final result of the equation 22. 35466166

Step 5: Round up to the nearest Unit to get you final answer. In order to minimize total cost, the lot size should be 23 when Company B orders new inventory.

References

Render, B., Stair, R. M., & Hanna, M. E. (2012). Quantitative analysis for management (11th ed.). Upper Saddle River, N. J.: Pearson Prentice Hall.