1. Comparison of four inventory models

	EOQ	(Q, R)	(P, T)	Newsvendor
Replenish	Yes	Yes	Yes	No
Terms of interest	Order quantity Q	Order quantity Q Reorder point R	Period length P Target level T	Profit-maximizing quantity Q^*
Context	Constant demand and no lead time	Uncertain demand and lead time	Uncertain demand and lead time	Uncertain demand

2. Computation of key quantities

   (a) Economic Order Quantity (EOQ)

   $$\text{EOQ} = \sqrt{\frac{2 \times S \times D}{h}},$$

   where D and h are respectively the demand and holding cost within the same amount of time, and S is the fixed setup cost incurred per order.

   (b) Continuous review model (Q,R)

   $$Q = \sqrt{\frac{2SD}{h}}, R = \mu_{LT} + z\sigma_{LT},$$

   where μ_{LT} is the mean demand during lead time LT, σ_{LT} is the demand standard deviation during lead time LT, and z represents the z score based on the service level.

(c) Periodic review model (P,T)

$$P = \sqrt{\frac{2S}{Dh}}, T = \mu_{P+LT} + z\sigma_{P+LT},$$

where S, D, h are defined the same as in the (Q,R) model, μ_{P+LT} is the mean demand during $P + LT$, σ_{P+LT} is the demand standard deviation during lead time $P + LT$, , and z represents the z score based on the service level.

(d) Newsvendor The order quantity Q^* satisfies

$$\text{Prob}(D \leq Q^*) = \text{Critical ratio} = \frac{G}{G + L},$$

where G is gain if stock additional unit and sell it, and L is loss if stock additional unit and don't sell it.

References

[TC2006]   C. TERWIESCH and G. CACHON, Matching supply with demand: An introduction to operations management (Chapter 2, 5, and14), McGraw-Hill 2006

[SG2018]   R. SCHROEDER and S. M. GOLDSTEIN, Operations Management in the Supply Chain (Chapter 14), McGraw-Hill 2018