

CAUTION !! All new procedures and processes should be checked in the 'Test' environment before being applied to the 'Live' business system.

STOCK (INVENTORY) & ECONOMIC ORDER QUANTITY (EOQ)

INTRODUCTION

Stock, or inventory, includes raw materials, spares, consumable and bulk issue items, work in progress and finished goods. Stock occurs where the timing of supply and demand does not match. It is usually managed through ERP systems such as Sapphire that have a number of functions including the generation of stock status reports and demand forecasts, and the updating of stock records.

There are various opinions as to whether stock is a good or a bad thing for a business.

REASONS FOR HOLDING STOCK

Stock is necessary to

- provide protection against uncertainty between supply and demand requirements (buffer stock)
- allow economic production and purchase
- cover anticipated changes in demand and supply
- cope with delays in the supply chain
- provide an "acceptable" level of customer service
- "decouple" stages of production
- smooth the capacity loading
- cope with the inability to manufacture all products simultaneously

In summary, stock allows a business to provide better service when demand and production is variable, acting as an insurance and asset.

REASONS FOR NOT HOLDING STOCK

Stock is unnecessary as it

- takes up space
- requires working capital
- becomes lost/stolen/dirty/broken
- becomes obsolete, or unusable ('shelf life' items)
- needs managing
- needs handling
- conceals problems

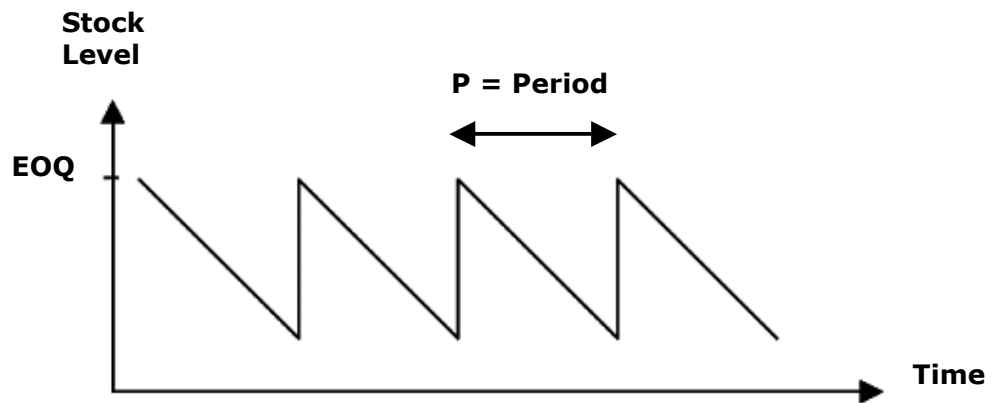
All businesses should be aware of the 'for and against' arguments for holding stock and chose a balanced approach.

DETERMINING THE AMOUNT OF STOCK TO HOLD

The amount of stock held will depend on balancing the costs associated with holding that stock against the costs associated with placing an order. The main stock-holding costs are normally related to working capital, whereas the main order costs are typically linked to the transactions necessary to create the information to place an order.

Economic Order Quantity (EOQ)

The most common method for calculating the amount of stock to order is called the Economic Order Quantity (EOQ). The method aims to balance the financial advantages and disadvantages of holding stock.



The EOQ formula is as follows:

$$EOQ = \sqrt{(2DCo)/Ch}$$

Where

D	= Demand (For example, Units per Month)
Co	= Ordering Cost per Unit
Ch	= Holding Cost per Unit

Using the EOQ method, an operation should replenish its stocks every period

$$P = EOQ/D$$

The EOQ model has a number of limitations as it assumes

- Constant demand
- Instantaneous delivery
- Single product
- Fixed set up costs
- Ignores Quantity Discounts

BlueStone Solutions for Business

Unit A, Tayside Software Centre, Technology Park, Dundee, DD2 1TY

Email: sales@bluestone-solutions.co.uk www.bluestone-solutions.co.uk

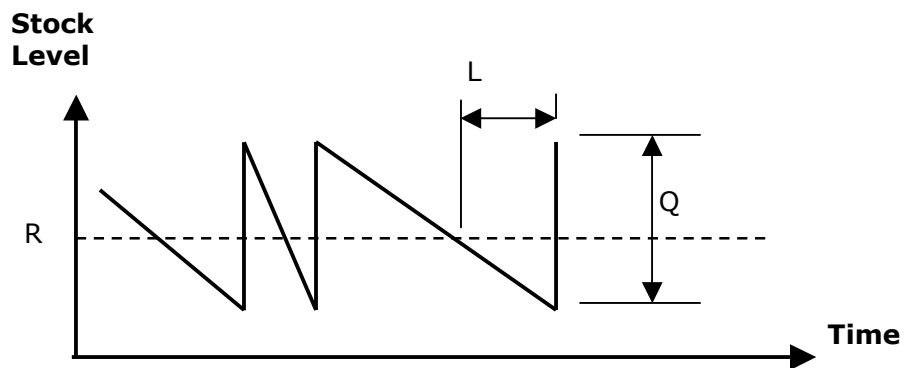
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DECIDING WHEN TO REORDER

Orders are normally timed to ensure a level of average safety stock is still available when the order arrives. The level of safety stock is influenced by the variability of both demand and the lead-time of supply. These two variables are normally combined into a lead-time usage distribution.

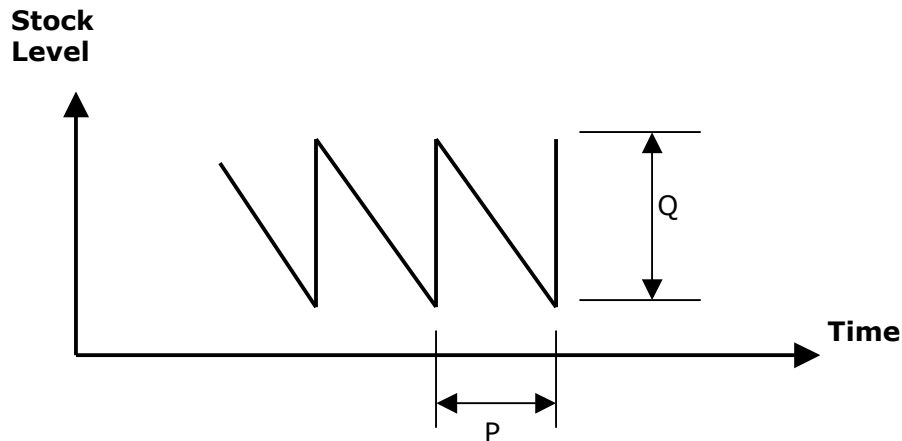
Continuous review

The stock levels are continuously monitored. When the stock level falls to level R, a fixed quantity Q of new stock with a known lead-time L is re-ordered. Statistical analysis is conducted to evaluate the risks of using different R and Q. The Sapphire Reorder reports are used to determine stock levels that have reached the reorder level.



Periodic review

Rather than ordering at a pre-determined re-order level, the periodic approach orders at a fixed and regular time interval P. The time interval P is often set to the optimised EOQ time interval $P = EOQ/D$.



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