A Course Material on

LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Subject : LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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LECTURE- 13

Example of Economic Order Quantity (EOQ)

EOQ considers the timing of reordering, the cost incurred to place an order, and the costs to store merchandise. If a company is constantly placing small orders to maintain a specific inventory level, the ordering costs are higher, along with the need for additional storage space.

For example, consider a retail clothing shop that carries a line of men's shirts. The shop sells 1,000 shirts each year. It costs the company $5 per year to hold a single shirt in inventory, and the fixed cost to place an order is $2.

The EOQ formula is the square root of (2 x 1,000 shirts x $2 order cost) / ($5 holding cost), or 28.3 with rounding. The ideal order size to minimize costs and meet customer demand is slightly more than 28 shirts.

Disadvantages of Using Economic Order Quantity (EOQ)

The basis for the EOQ formula assumes that consumer demand is constant. The calculation also assumes that both ordering and holding costs remain constant. These assumptions make it difficult. It is not possible to account for unpredictable business events, such as changing consumer demand, seasonal changes in inventory costs, lost sales revenue due to inventory shortages, or purchase discounts a company might get for buying inventory in larger quantities.

Economic Order Quantity (EOQ):

Economic order quantity (EOQ) is the ideal order quantity a company should purchase to minimize inventory costs such as holding costs, shortage costs, and

order costs. This production-scheduling model was developed in 1913 by Ford W. Harris and has been refined over time.

The formula assumes that demand, ordering, and holding costs all remain constant.

- The EOQ is a company's optimal order quantity that minimizes its total costs related to ordering, receiving, and holding inventory.
- The EOQ formula is best applied in situations where demand, ordering, and holding costs remain constant over time.
- One of the important limitations of the economic order quantity is that it assumes the demand for the company's products is constant over time.

The formula for EOQ is:

Economic Order Quantity

$$EOQ = \sqrt{\frac{2 \times D \times S}{H}}$$

D = Annual demand (units)
S = Cost per order ($)
C = Cost per unit ($)
I = Holding cost (%)
H = Holding cost ($) = I x C

What the Economic Order Quantity Can Tell You

The goal of the EOQ formula is to identify the optimal number of product units to order. If achieved, a company can minimize its costs for buying, delivering, and storing units. The EOQ formula can be modified to determine different production levels or order intervals, and corporations with large supply chains and high variable costs use an algorithm in their computer software to determine EOQ.

EOQ is an important cash flow tool. The formula can help a company control the amount of cash tied up in the inventory balance. For many companies, inventory is its largest asset other than its human resources, and these businesses

must carry sufficient inventory to meet the needs of customers. If EOQ can help minimize the level of inventory, the cash savings can be used for some other business purpose or investment.

The EOQ formula determines a company's inventory reorder point. When inventory falls to a certain level, the EOQ formula, if applied to business processes, triggers the need to place an order for more units. By determining a reorder point, the business avoids running out of inventory and can continue to fill customer orders. If the company runs out of inventory, there is a shortage cost, which is the revenue lost because the company has insufficient inventory to fill an order. An inventory shortage may also mean the company loses the customer or the client will order less in the future.

Example of How to Use EOQ

EOQ takes into account the timing of reordering, the cost incurred to place an order, and the cost to store merchandise. If a company is constantly placing small orders to maintain a specific inventory level, the ordering costs are higher, and there is a need for additional storage space.

Assume, for example, a retail clothing shop carries a line of men's jeans, and the shop sells 1,000 pairs of jeans each year. It costs the company $5 per year to hold a pair of jeans in inventory, and the fixed cost to place an order is $2.

The EOQ formula is the square root of (2 x 1,000 pairs x $2 order cost) / ($5 holding cost) or 28.3 with rounding. The ideal order size to minimize costs and meet customer demand is slightly more than 28 pairs of jeans. A more complex portion of the EOQ formula provides the reorder point.

Limitations of Using EOQ

The EOQ formula assumes that consumer demand is constant. The calculation also assumes that both ordering and holding costs remain constant. This fact makes it difficult or impossible for the formula to account for business events such as changing consumer demand, seasonal changes in inventory costs, lost sales revenue due to inventory shortages, or purchase discounts a company might realize for buying inventory in larger quantities.[2]

Questions :

What does economic order quantity mean?

Economic order quantity is a technique used in inventory management. It refers to the optimal amount of inventory a company should purchase in order to meet its demand while minimizing its holding and storage costs. The economic order quantity is just one of many formulas used to help companies make more efficient inventory management decisions. One of the important limitations of the economic order quantity is that it assumes the demand for the company's products is constant over time.

How is economic order quantity understood?

Economic order quantity will be higher if the company's setup costs or product demand increases. On the other hand, it will be lower if the company's holding costs increase.

Why is economic order quantity important?

Economic order quantity is important because it helps companies manage their inventory efficiently. Without inventory management techniques such as this, companies will tend to hold too much inventory during periods of low demand, while also holding too little inventory in periods of high demand.

Either problem creates missed opportunities for companies: too much inventory generally means too little cash on hand, while not holding enough inventory will lead to missed sales. For investors, calculating the economic order quantity for a company can help to assess how efficiently that company is managing its inventory.