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Chapter 1 : Economic Order Quantity (EOQ) Definition, Formula, Example - calendrierdelascience.com

Economic Order Quantity (EOQ) Model 5 References [1] S. K. Goyal,Economic Order Quantity under Conditions of Permissible Delay in Payments,The Journal of the Operational Research Society, Vol. 36, No. 4.

Therefore, analysis inventory control policies are important to be understood, including carrying cost, ordering cost, warehouse renting cost, and buying cost. The first model concerned to costs carrying cost, ordering cost, warehouse renting cost and buying cost , which is considered as triangular fuzzy numbers. The second model was in addition to inventory the cost system, in which annual demand is also reviewed as fuzzy numbers. In each model, graded mean integration representation GMIR deffuzification was used for parameters deffuzification. Then, the final objective from this analysis was to obtain economic quantity formula through derivation. Product life cycle cost analysis: State of the art review. International journal of production research, 36 4 , An analytical solution to a fuzzy economic order quantity problem. International journal of approximate reasoning, 50 3 , An application of fuzzy sets theory to the EOQ model with imperfect quality items. Computers and operations research, 31 12 , Graded mean representation of generalized fuzzy numbers. Journal of chinese fuzzy systems, 5 2 , Applying an integrated fuzzy MCDM method to select hub location for global shipping carrier-based logistics service providers. WSEAS transactions on information science and applications, 10 2 , Operations research, 27 2 , Modeling just-in-time purchasing in the ready mixed concrete industry. International journal of production economics, 1 , Indonesian journal of science and technology, 1 2 , An R package implementing gradient descent and its variants for regression tasks. International conference on IEEE, A fuzzy EOQ model with demand-dependent unit cost under limited storage capacity. European journal of operational research, 99 2 , Economic production quantity model for items with imperfect quality. International journal of production economics, 64 1 , Inventory models with a mixture of backorders and lost sales under fuzzy cost. European journal of operational research, 1 , Inventory without backorder with fuzzy total cost and fuzzy storing cost defuzzified by centroid and signed distance. European journal of operational research, 2 , Fuzzy inventory with backorder for fuzzy order quantity. Information sciences, 93 ,

Chapter 2 : Economic Order Quantity - EOQ

Economic Order Quantity (EOQ) models have been effectively employed in marketing, au tomotive, pharmaceutical, and retail sectors of the economy for many years.

The EOQ is used as part of a continuous review inventory system in which the level of inventory is monitored at all times and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. The EOQ provides a model for calculating the appropriate reorder point and the optimal reorder quantity to ensure the instantaneous replenishment of inventory with no shortages. It can be a valuable tool for small business owners who need to make decisions about how much inventory to keep on hand, how many items to order each time, and how often to reorder to incur the lowest possible costs. The EOQ model assumes that demand is constant, and that inventory is depleted at a fixed rate until it reaches zero. At that point, a specific number of items arrive to return the inventory to its beginning level. Since the model assumes instantaneous replenishment, there are no inventory shortages or associated costs. Therefore, the cost of inventory under the EOQ model involves a tradeoff between inventory holding costs the cost of storage, as well as the cost of tying up capital in inventory rather than investing it or using it for other purposes and order costs any fees associated with placing orders, such as delivery charges. The EOQ model finds the quantity that minimizes the sum of these costs. The basic EOQ relationship is shown below. D is the total number of units purchased in a yearâ€”assume 3, units. Q is the quantity ordered each time an order is placedâ€”initially assume gallons per order. Notice that the main variable in this equation is the quantity ordered, Q. The painter might decide to purchase a smaller quantity. If he or she does so, more orders will mean more fixed order expenses represented by S because more orders are handlesâ€”but lower holding charges represented by H: But now the results are unfavorable. Where is the optimal purchase quantity to be found? The EOQ formula produces the answer. We can calculate the order quantity as follows: Take the square root of that and get That number is then Q. Thus EOQ is defined by the formula: The number we get, in this case, divided into 3, units, suggests that the painter should purchase paint 19 times in the year, buying gallons at a time. The EOQ will sometimes change as a result of quantity discounts offered by some suppliers as an incentive to customers who place larger orders. He must compare the total costs of taking this approach to the total costs under the EOQ. Ordering the higher quantity and receiving the price discount would yield a total cost of 4. EOQ calculations are rarely as simple as this example shows. Here the intent is to explain the main principle of the formula. The small business with a large and frequently turning inventory may be well served by looking around for inventory software which applies the EOQ concept more complexly to real-world situations to help purchasing decisions more dynamically. Balakrishnan, Antaram, Michael S. Pangburn, and Euthemia Stavrulaki. Khouja, Moutaz and Sungjune Park. Lionheart Publishing, March

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Chapter 3 : Economic order quantity - Wikipedia

International Journal of Computer Applications (-) Volume - No. 19, December 2 An inventory control model i.e. Economic Order Quantity model is used.

Economic Order Quantity EOQ is a production formula used to determines the most efficient amount of goods that should be purchased based on ordering and carrying costs. In other words, it represents the optimal quantity of inventory a company should order each time in order to minimize the costs associated with ordering and holding inventory. What is the definition of economic order quantity? The benefit for an organization to spend time calculating EOQ is to minimize its inventory costs and, in turn, make strides toward being as efficient as possible. A business can use this calculation to determine exactly when an order needs to be placed and exactly how much should be ordered so that the company can continue normal production and minimize inventory costs. EOQ is an extremely effective tool for managers because they can use it to figure out what is the optimal amount of inventory to hold on hand as well as to calculate when to order more merchandise because new sales should be generated. The EOQ formula is calculated by using the demand rate, setup costs, production costs, and interest rate: Personnel and shipping costs are associated with ordering inventory while warehousing and security costs are associated with carrying costs. All of these must be included in any inventory cost allocation because management is trying balance both sets of costs. Less shipments of higher quantity lower the ordering costs, but increases the carrying costs because more inventory will be sitting on shelves longer. The opposite is true with more shipments. Next, she uses the EOQ calculation to develop her ordering strategy. Thus, Jenna should order pairs of jeans in each order. If she ordered any more than that, she would increase carrying costs. If she ordered less, she would increase ordering costs. This is the perfect balance of each. It is trying to determine how much it should purchase from its suppliers in order to make sure that they can cover production but also minimize inventory costs. The company has an annual demand of 40, units. We can calculate economic order quantity formula by plugging the variables into the equation mentioned above: EOQ means a calculation that helps to determine the amount of material a company should request from suppliers and hold in its inventory given certain factors including demand, production, and inventory cost.

Chapter 4 : What is Economic Order Quantity (EOQ)? - Definition | Meaning | Example

In inventory management, economic order quantity (EOQ) is the order quantity that minimizes the total holding costs and ordering calendrierdelascience.com is one of the oldest classical production scheduling models.

This is an open access article distributed under the Creative Commons Attribution License , which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. Abstract In the traditional inventory system, it was implicitly assumed that the buyer pays to the seller as soon as he receives the items. Unlike most of the previous studies, the demand function of the customers is considered to increase with time. The replenishment decisions optimally are obtained using genetic algorithm. Two special cases of the proposed model are discussed and the impacts of parameters on the decision variables are finally investigated. Numerical examples demonstrate the profitability of the developed two-level supply chain with backorder. Introduction Since the introduction of the classical economic order quantity EOQ model by Harris [1], many researchers have extended it in several ways. One of the discussed issues in this area is including delay in payment, as an incentive system, in the EOQ or economic production quantity EPQ models [2]. According to Piasecki [3] and Molamohamadi et al. In the first type of delay in payment, so-called consignment inventory, the buyer defers paying for the items till they are sold to the customers. The second type refers to the case that the buyer pays off as soon as he sells the items to the customers during a predefined period. At the end of this period, he can either pay for the remaining items in his stock or return the unsold items to the vendor. According to the third type of delay in payment, which is known as trade credit in the literature, the buyer must pay to the vendor at the end of a predetermined period. During the credit period, the buyer sells the items to his customers and accumulates revenue and earns interest. After this period, however, he would be charged a higher interest if the payment is not settled. Based on the fourth type, the payment for each order would be settled at the time of the next replenishment order. Therefore, there is one replenishment cycle delay for each received order in this type. The advantage of delay in payment contract to the buyer is obvious; he does not need to invest his capital in inventory and can earn interest for the items he sells. Moreover, the vendor can apply this agreement as a sales promotional tool for attracting new buyers and selling new and unproven products. As this paper focuses on the third type of delay in payment, we review the literature related to trade credit please refer to Seifert et al. Goyal [7] presented an EOQ mathematical model for determining the economic order quantity where the supplier offers a fixed credit period to the retailer to settle the account. His paper is the infrastructure for its following studies. Aggarwal and Jaggi [8] extended Goyal [7] by considering deterioration rate and assuming that the customer accumulates the sales revenue and earns interest during the credit period and beyond it. Huang [12] considered a two-level trade credit and deduced Goyal [7] as a special case of his research. In a two-level trade credit, not only does the vendor offer trade credit to the buyer, but the retailer also provides a credit period to his customers. Huang [15] established an economic order quantity model in which the supplier provides the retailer partially permissible delay in payment for the order quantities smaller than a predetermined quantity and offers him complete trade credit otherwise. Huang [16] differentiated between the purchase cost and the selling price and presented an EPQ model under two levels of trade credit to generalize Chung and Huang [11] and Huang [12]. He further assumed that the latter is affected by the market demand and production rates, and the production rate is sensitive to the price dependent market demand. He finally obtained the optimal pricing, ordering, and inventory decisions of a profit maximizing system under trade credit contract. Dye and Ouyang [19] proposed an EOQ mixed-integer nonlinear programming model under two levels of trade credit for deteriorating items with time-varying demand and applied a traditional particle swarm optimization PSO algorithm to determine the optimal selling price and replenishment policy. Dye [20] applied PSO algorithm to obtain the optimal replenishment decisions of an EOQ model with price and time dependent demand, partially backlogged items, and deterioration under two-level trade credit policy. Lou and Wang [22] formulated an EPQ inventory model for defective items under two independent levels of trade credit to extend some of the previous studies including Goyal [7], Teng [10], Huang [12], and Teng and Goyal [14].

Having applied cuckoo search algorithm, Molamohamadi et al. Some of the previous models such as Goyal [7] and Teng [10] are mentioned as special cases of their proposed model. Reviewing the literature clarifies that trade credit has received great attention of the researchers, while it has still outstanding space for further studies. For instance, it is mostly assumed that the demand rate is constant. However, recently, Teng et al. Although, their model can be considered as a generalization of its preceding studies, it has great potential for further extension. As it is stated in Jamal et al. Moreover, in practices, not only does the supplier propose a delay period to the retailer, but the retailer also allows his customers to defer their payment. Thus, considering two levels of trade credit contributes to practical situations. Considering the gaps in the literature, we extend the proposed model of Teng et al. The proper replenishment policy and the maximum profit of the retailer are then obtained by applying genetic algorithm GA. It is finally deduced that the inventory system of Teng et al. The rest of this paper is organized as follows. Section 2 lays out the notations and assumptions used in the modeling of the problem. The model is formulated in Section 3 and the two special cases of the presented model presented are discussed in Section 4. The genetic algorithm, used for solving the model, is described in Section 5. Regarding the numerical examples of Teng et al. Notations and Assumptions The following notations and assumptions are used in this paper.