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2019 Impact Factor: 1.366

July 2020, 16(4): 1613-1633. doi: 10.3934/jimo.2019020

A collaborative EPQ inventory model for a three-echelon supply chain with multiple products considering the effect of marketing effort on demand

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This paper presents an inventory model for a three-echelon supply chain with multiple products and multiple members considering the demand as an increasing function of the marketing effort. In the proposed inventory model, a collaborative approach is studied and an analytical method is applied to obtain the optimal production lot size and the optimal marketing effort in order to achieve the maximum profits. Some numerical examples are illustrated to justify the model. Moreover, a sensitivity analysis is well done in order to analysis the effect of the changes of key parameters of inventory model on the the maximum benefits of all members of the chain.

Keywords: Inventory, supply chain collaboration, multiple products, marketing effort, economic production quantity.