

# **A Continuous Review Inventory Model With Backorders And Equivalencies**

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## **Abstract**

Nowadays, increase in the prevalence of preventable viruses, age-related treatments and similar health problems that are transmitted by non-organic nutrients or environmental factors, escalate drug usage. To meet this accelerated request, a pharmacy typically store pharmaceutical products and their equivalencies in their depots before being sold to the customer. Therefore, several problems may rise about the stock of the original drug and its equivalence such as non-optimal storing of products in depots, lack of storage space, shortening of product life, and cost of medical waste in non-resale products. In this study, a general continuous review inventory model with backorders and equivalencies, which is not in the literature, has been proposed. A case from a big pharmacy is analyzed by using realistic parameters in order to show the efficiency of the model in real life inventory systems. The results confirm that the proposed model is very accommodating to minimize inventory cost with optimized order quantities and reorder points.

## **Keywords**

Inventory, Pharmacy, Continuous review, Reorder point, Backorder,

## **Biographies**

**G.Yazgı Tütüncü** completed her MSc degree in Statistics from Ankara University in 2001 and her MEng in Industrial Engineering from Baskent University in 2003. She was awarded PhD in Operations Research and Statistics from Coventry University (UK) in 2006. She worked as an Assistant Professor at İzmir University of Economics in Turkey from 2006 to 2008 and at IESEG School Management, Lille Catholic University in France from 2008 to 2010. Currently, she is a Professor at İzmir University of Economics, Department of Mathematics. Her research has been in Operations Research, Health Care System Optimization, Heuristic Approaches to Decision Making Problems and Applied Probability focusing on System Optimization and Reliability control. She has published her research previously in several journals including; International Journal of Production Economics, European Journal of Operation Research and International Journal of Management (OMEGA).

**Elif Duymaz** is senior student at Izmir University of Economics Department of Mathematics. Her research interest are solving non-differential equations, modelling optimization problems and coding using R, Python and C++. She studied non-differential equations of kinetic model of phage infection and optimization techniques for vehicle routing model.