Retailer Optimal Policies in a Bicriteria Objective within a Price-Dependent Newsvendor Framework

F. J. Arcelus
Faculty of Business Administration
University of New Brunswick,
Fredericton, New Brunswick, E3B 5A3, Canada
arcelus@unb.ca

Satyendra Kumar
JDA Software (India) Pvt. Ltd.
Hyderabad, India
satyendra.kumar@jda.com

G. Srinivasan
Faculty of Business Administration
University of New Brunswick
Fredericton, Canada
srini@unb.ca

Abstract

One of the most recent extensions of the classical newsvendor problem (NVP) is the formulation of a bicriteria decision problem whereby the newsvendor incorporates into the same objective function the conflicting goals of maximizing the expected profit and the probability of exceeding it, the latter known also as the satisfying objective. Parlar and Weng (2003) review the literature on the use of the two objectives within the NVP framework and present the pioneering work on the subject. Arcelus et al (2012) obtains a closed form solution for a uniformly distributed demand, but with a constant price. This is done by using the existence of a closed form solution for the second criterion to arrive at the solution for the Bicriteria problem. The other promising research area in NVP framework is to model both the price and order quantity in the retailer's optimization policy and follows the pioneer work of Petruzzi and Dada (1999). In this paper, we have merged these two extension areas and address the bicriteria decision problem whereby the retailer incorporates in its objective function the conflicting goals of maximizing the expected profit and the probability of exceeding it and determines both the optimal price and the order quantity within a newsvendor framework.