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An Off-Price Retailer with Two Ordering Opportunities and Demand Updating

Abstract: We develop a model of an off-price retailer who has two procurement opportunities for next season. The first opportunity occurs after the end of the current season when the off-price retailer buys excess inventory from retailers and manufacturers and store them until next season. The second opportunity occurs at the beginning of the next selling season when retailers and manufacturers sell anticipated excess inventory, production overruns and irregular units. At the time of the first ordering opportunity the price for the second ordering opportunity is a random variable whose parameters depend on future prevailing economic conditions. Sometime between the first and second ordering opportunities, the off-price retailer observes a market signal which updates her demand forecast. We find that for non-trendy products, the first ordering opportunity provides the off-price retailer with a way to obtain some inventory at a low cost to hedge against the possibility of high demand with higher prices in the next season. We also find that the off-price retailer is less likely to take advantage of the first ordering opportunity in the case of trendy products which have a large premium for newness. Under limited supplies the off-price retailer is more likely to use the first ordering opportunity even when there is a premium for the newness of the second order.

Keywords: Off-price retailers; supply chain management; Newsvendor model

1 Introduction

On a visit to a regional distribution center of a large off-price retailer in February of 2013, we observed forklift operators placing boxes of products on the top shelves of high storage bins while many lower shelves were empty. Upon inquiry of why not use the more easily accessed lower shelves first, the manager informed us that these boxes contain leftover seasonal products which the company buyers have purchased from manufacturers and retailers. These products will be stored for about nine months and then shipped to stores to be sold in the coming holiday season. Since these products will be in storage for a long time, it is best to have them stored on the top shelves while leaving the lower shelves for products which are stored for shorter durations. This behavior contradicts the classic assumption of the newsvendor model, i.e. no inventory is carried from one season to the next. Here, the off-price retailer, buys inventory at the end of the current season, stores it in warehouses for a long time until the next selling season. Before the beginning of the next season, the off-price retailer may buy more inventory to supplement the inventory already stored in the warehouses to offer to consumers.

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