

# Assortment Planning of Vertically Differentiated Products for Heterogeneous Customers

## Abstract

We consider the assortment planning problem of a retailer selling quality differentiated products of a single category to consumers who have heterogeneous preference for quality. The retailer does not know the type of each consumer but knows the distribution of preference and how consumers make choice. Consumers observe the quality and prices of the products in the assortment, and choose a product that maximizes their utility. Due to such consumer choice, each product in the assortment gets a random demand stream and therefore assortment decision depends on the inventory cost. We find that as compared to deterministic demand, under stochastic demand, the optimal prices increase and the optimal assortment size reduces, in order to reduce the effect of inventory costs arising from random demand. Further, while the retailer offers a wider range of products for such a heterogeneous mix of customers, under special conditions, the optimal assortment offered under demand uncertainty is a subset of that under deterministic demand.