

The Distribution Free Newsvendor Problem: An Experimental Approach

Abhishek Shinde* Peeyush Mehta† R K Amit‡

The classical stochastic inventory problems are modelled overwhelming within a newsvendor setting with known demand distribution. However, complete knowledge of demand distribution is a luxury nowadays with decreasingly life cycle of products and increase in complexity of demand forecast. Any imprecise educated guess of demand distribution results in a huge deviation in resulting optimal inventory policy. Hence, stochastic inventory problems with distribution free demand forecast are gaining attraction. Interestingly, Scarf et. al. (1958) is one of the earlier works that characterize distribution free inventory problem. They develop an inventory policy that maximizes the minimum expected profit (maxmin approach) when only the mean and the standard deviation of the demand distribution are known. Perakis and Roels (2008) derive the inventory policies that minimize the newsvendor's maximum regret of not acting optimally (minmax regret approach). However, the empirical studies in distribution free newsvendor problems are limited. In this research, we design an experiment and determine the ordering behavior of the decision makers for distribution free newsvendor problems. Our experimental results reveal that the decision makers deviate from the prescribed rationality in the existing normative models of distribution free newsvendor problems. We analyze the judgment and biases in decision making that lead to the deviation.

References

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*Indian Institute of Management Calcutta, abhishekjs11@email.iimcal.ac.in

†Indian Institute of Management Calcutta, pmehta@iimcal.ac.in

‡Department of Management Studies, Indian Institute of Technology Madras, rkamit@iitm.ac.in