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Revisiting Prospect Theory and the Newsvendor Problem

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Abstract

Many experimental studies have demonstrated that human decision-makers exhibit the pull-to-center effect in newsvendor decision. It has been shown in the literature that prospect theory with a decision-dependent reference point can predict the pull-to-center effect for the newsvendor problem by assuming a uniform distribution of demand. In this paper, we prove this result for a general case: prospect theory with a decision-independent reference point can predict the pull-to-center effect for the newsvendor problem with a general distribution of demand.

Keywords: Prospect theory; Newsvendor; Pull-to-center effect; Reference point.

1. Introduction

In the past decade, behavioral operations management has garnered an increasing amount of research interest. In a pioneering work, Schweitzer and Cachon [1] conducted experiments to investigate the behavior of human decision-makers based on newsvendor settings. They observed that the order quantity of subjects exhibited a "pull-to-center" effect, i.e., the order quantity was likely to fall in the range between the 0.5 fractile of the demand distribution and the optimal solution. According to the newsvendor model, settings with a critical fractile in the range [0, 0.5) are classified as low-profit

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