

The Bright and Dark Sides of Perception Biases in Inventory Decisions

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Abstract

Extensive studies have shown that inventory decisions by human decision makers are often biased by cognitive limitations. As a consequence, decision makers fail to achieve the optimal performance prescribed by normative models. Biases are liabilities in individual inventory decision-making, and de-biasing technics have been proposed to improve decision quality.

In this paper, we analyze the impact of perception biases in competing inventory decisions. In particular, we focus on two types of biased perceptions of demand uncertainty, namely, overoptimism and overprecision. The former bias leads to a higher estimation of demand than the actual distribution, and the latter leads to a confidence interval narrower than that of the actual demand. We analyze how a manager's perception bias affects each other's inventory decisions and performances in strategic interactions, and more importantly who benefits from these biases in the short and long runs.

In contrast to the findings in individual inventory decision-making, this study shows that a perception bias can serve as a competitive advantage in the sense that an inventory manager who is biased either by overoptimism or by overprecision can benefit from the bias and achieve a higher profit than an unbiased competitor. This result remains unchanged when we extend the analysis to the cases in which inventory managers do not have perfect information about the competitor's bias. Furthermore, when managers are under selection pressure based on their relative performance, our study shows that in almost all situations managers with a perception bias are selected in the long run.