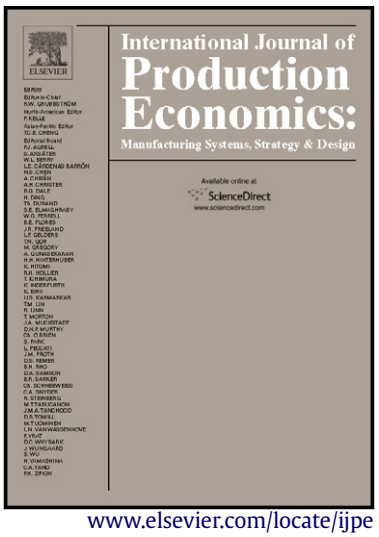


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**On Human Decision Behavior in Multi-echelon Inventory Management**

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**Abstract**

We conducted experiments in a multi-echelon inventory system with two scenarios: no information sharing and full information sharing. The results indicate that the bullwhip effect persists even after traditional causes have been excluded. Moreover, full information sharing cannot guarantee performance improvement. From a behavioral perspective, we analyze different causes of the bullwhip effect for the two scenarios with linear regression models. Additionally, we find that the attitudes on two important inventory factors (the on-hand inventory and the stockout) are reversed in the two scenarios. These results may provide managers with useful new ideas for improving performance.

**Keywords**

Behavior; multi-echelon supply chain; inventory; decision analysis

# 1 Introduction

This study employs a laboratory experiment to investigate the behavioral biases in a multi-echelon supply chain system. In supply chain management, mathematical models can give optimal policies, such as the optimal ordering quantity. However, these theoretical results are challenged. In the real world, decision makers are not as perfectly rational as assumed in mathematical models. When people make decisions, they are easily distracted from the perfectly rational policy and make biased decisions. Croson and Donohue (2002) suggest that laboratory experiments are helpful for the behavioral study of supply chains. As they note, experiments can be used in studying the influence of behavioral factors on a specific phenomenon, investigating the relative strength of the reasons for the bullwhip effect, testing the operations theory, and measuring the interaction between the operational factors and behavioral factors. Siemsen (2011) also supports the usefulness of laboratory experiments with three advantages: “control, efficiency and responsiveness”. In recent