

## 协调多零售商横向转载的收益共享契约

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### The Revenue-sharing Mechanism: Coordinating the Multilocation Lateral Transshipment Problem

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**摘要** 本文研究了协调多零售商横向转载的收益共享契约。该契约包含批发价格和收益共享比例两个参数,由独立于零售商的第三方转载公司制定并实施。在建立多零售商转载博弈模型的基础上,给出了该契约协调零售商转载的充分必要条件;然后以包含两个零售商的转载系统为例,分别给出了协调情形下转载价格和收益共享比例需满足的条件及其解析表达式,并设计了一类启发式算法来计算零售商的最优订货量、转载价格和期望利润。最后,通过一个算例对文中的相关研究结论进行了验证,并就相关参数对零售商期望收益的影响进行了分析。研究发现,收益共享是对称性零售商的占优选择;非对称情形下,较高的转载成本将导致协调情形下零售商的期望利润降低;较高的产品残值将要求选择较低的转载价格,确保协调契约对于零售商期望利润的帕累托改进;当产品的边际价值较高时,提高转载价格可改善零售商的期望利润;另外,灵敏度分析显示契约参数将显著影响非对称性零售商的期望利润。

**关键词:** 供应链 横向转载 收益共享契约 协调机制

**Abstract:** It this paper the revenue-sharing contract for coordinating the multilocation lateral transshipment is studied. It includes two contract parameters, which are designed and implemented by an independent transshipment corporation. A non-cooperative game model is established to describe the transshipment system behavior and the necessary and sufficient condition for the contract to coordinate transshipping behavior is constructed. Taking a two-location system as an example, the analytical results of transshipment price are derived and the necessary conditions of revenue-sharing ratio under which the system is coordinated by the contract are proposed. Moreover, a heuristic algorithm is developed to calculate the retailer's optimal order volume, transshipment price and expected profits. Furthermore, numerical results verify the theoretical conclusions and examine sensitivity of some parameters. It is found that: (1) Under symmetric case, revenue-sharing strategy is a dominant choice for retailers which involved in transshipping; (2) Under asymmetric case, higher transshipment costs can make retailer's expected profits decreasingly; (3) Matching lower transshipment price, higher salvage value can make retailer's expected profits increasingly; (4) With higher transshipment price, higher marginal value can make retailer's expected profits increasingly. Sensitivity analysis results show the significant influence of contract parameters (transshipment price and revenue-sharing ratio) on retailer's profits under asymmetric case.

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