

RFID技术压缩提前期对供应链收益的影响与协调

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Effect of RFID Technology on Lead-time Compression and Coordination of Supply Chain's Revenue

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摘要 RFID技术能够压缩供应链的提前期,提高零售商的服务水平,同时也会增加供应链的成本,如何协调采用RFID技术后供应链成员收益是迫切需要解决的问题。本文针对单供应商和单零售商的两级供应链,考虑提前期变化对供应链及其成员收益的影响,在假定RFID单位标签成本为一定值的情况下,研究了采用RFID技术前后分散式供应链和集中式供应链的收益,并探讨了契约参数的变化对供应链协调的影响。结果表明,收益共享契约能有效地协调采用RFID技术后的供应链,实现供应链成员的共赢,但是采用RFID技术后,能够协调供应链的契约参数的区间缩小,零售商的最优订货量减少,供应商的批发价格上升。最后得出供应链采用RFID技术后提前期压缩量的阈值,通过数值分析对结论进行了验证,该研究为供应链企业采用RFID技术提供了相应的管理启示。

关键词: 两级供应链 RFID技术 提前期压缩 收益共享契约 协调

Abstract: RFID technology can reduce lead-time and increase the retailer's service level. However, it can also affect the income of the supply chain, which makes it urgent to study the coordination of the supply chain members' revenue. It is assumed that the unit cost of RFID tag is fixed and the effect of lead-time compression on profit of supply chain actors is studied in this paper. With the lead-time compression, retailer collects more and more information about products sales and demands so that the market demand forecast will be more and more accurate. Using a Newsvendor model, the profits of both centralized and decentralized cases with/without consideration of deploying RFID technology are studied and the effect of changing contract parameters on the coordination of supply chain is found. The results show that the revenue sharing contract can coordinate the supply chain with RFID technology and allow all members of the supply chain to achieve win-win. However, the interval of contract parameters will shrink, the retailer's optimal order quantity will reduce and the supplier's wholesale prices will rise after adoption of RFID technology. Moreover, the threshold of lead-time compression amount with RFID is obtained, and a numerical simulation analysis is given to illustrate the model. This study provides some management revelations for application of RFID technology.

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