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通胀市场下多设备租赁的在线策略分析

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Competitive Strategy for On-line Multiple Devices Leasing in an Inflation Market

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摘要 现实租赁市场中,企业同时租赁多台设备的现象大量存在,但经营者面临的最大难题是如何对这多台设备进行在线租赁的组合优化,从而降低决策成本,而通货膨胀又进一步增加了决策难度。本文运用在线算法和竞争分析法建立多设备投资的风险控制策略,并分析通胀对决策的影响。首先在Karp经典模型上给出通胀因素下多设备投资的最优在线和离线策略;接着建立设备租赁在连续可分情形下的最优风险控制模型,进一步结合实际投资中设备必须以离散整数租赁的特点,对CR策略进行调整和优化,得到近似的CRJ策略,使得策略更符合实际投资活动。最后给出具体实例分析,结果显示,当物价指数逐渐增大时,最优决策日期相应提前,对应最优策略的竞争比也逐渐增大,进一步说明物价指数因素和多设备投资因素的引入对投资者的决策有着重要的影响,为多设备在线租赁问题的研究提供了新的解决思路。

关键词 ： 通货膨胀   多设备租赁   在线算法   竞争分析

Abstract ： There exist massive phenomena of leasing multiple devices at the same time in the real leasing market. And the biggest problem what the manager faces is to optimize the combination of multiple devices on-line leasing in order to reduce the decision-making cost. However, inflation further increases the difficulty. In this paper, risk control model for the multiple devices leasing problem is put forward using the method of on-line algorithm and competitive analysis, and the impact of inflation on decision-making is analyzed. Firstly, the on-line and off-line strategies are proposed respectively for the multiple devices leasing according to the model of Karp's with the factor of inflation. Then to improve the competitive ratio in Karp's model, the risk control strategy which we call the CR strategy is discussed in theory with the hypothesis that the device is continuous separability. Furthermore, when consider that the number of devices investing in real decision-making must be integer, the risk control model is reconstructed and optimized to gain a new approximate strategy-CRJ strategy. Finally, the optimal competitive performance of the strategy is discussed and illustrated by numerical analysis, which shows that the competitive performance of on-line strategy is affected by the fact of inflation and the ways of investing. More, a new idea in multiple devices leasing problem is given in this paper.

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