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低碳港口存货质押贷款利率定价理论和模型

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Research on Low-Carbon Port Logistics Pledge Loan Rate Model

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摘要

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摘要 在港口低碳转型大趋势下,港口存货类质押贷款业务在实践中得到高速发展,如何在港口物流存货质押贷款理论决策中融入低碳港口约束因素、间接推动港口转型升级显得十分迫切。本研究深入探讨低碳转型下的港口质押贷款利率决策理论,提出了无风险套利原理、期权调整利差原理、低碳控制原理和质押风险控制原理。在此基础上,借助看跌期权反映客户违约风险调整价差、构建质押货物的碳排放风险调整价差、采用VaR方法界定港口存货类质押率,建立了低碳港口流动性较强存货类物流质押贷款利率决策模型。重要参数敏感性分析表明:质押贷款利率与质押率呈现初始平稳、后上升、最后显著下滑,与回收率、质押物初始价格和质押物价格增长率三参数呈现初始显著下滑,最后平稳,与碳排放治理成本率、融资成本率、经营成本率、无风险利率四参数呈现同方向类线性增长变化,与质押物价格波动率、质押物价值变动率两参数呈现反方向变化。最后,采用某港口实际数据,验证了模型可行性、可用性。

关键词: 质押贷款利率 低碳港口 期权调整价差 碳排放调整价差 质押率

Abstract: The port logistics finance practice has been developed rapidly under the port low-carbon transition development. It is very urgent for upgrading port by integrating into a low-carbon port constraint in port logistics pledge loans decision-making theory. In this study, the low-carbon transition port pledge loan interest rate decision model was set up by risk-free arbitrage theory. Based on the option-adjusted spreads principle, the principles of low-carbon control and pledge risk control are proposed. The strong liquidity inventories of low-carbon port logistics pledge loan interest rate decision model was established with the put option reflecting customer default risk-adjusted spread, the pledged goods carbon emissions risk-adjusting spread, and VaR method defining port class of goods as security for loans pledged rate. The important parameter sensitivity analysis showed that: Pledged loan interest rate and pledge rate decline significantly after the initial steady, and then recovery, while pledge collateral initial price and the price growth rate of three parameters showed a significant decline in initial, last stable. Carbon discharge rate of treatment costs, financing cost rate, operating cost ratio, risk free rate four parameters showed change in the same direction with the pledge price volatility, collateral value of the rate, change in the opposite direction with pledge loan interest rate and pledge rate. Finally, a port actual case verifies the model feasibility and usability.

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