

资产结构与证券价格的非线性动态模型

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Nonlinear Dynamic Model of Capital Structure and Security Price

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摘要 根据真人被试的行为金融实验现象, 本文构建了描述市场平均投资态度和股票价格的数学模型。首先利用离散动力系统的相关理论研究了模型的稳定性, 然后根据金融市场稳定与否对传染效应进行界定。数值模拟发现, 在中度传染效应区内, 存在最优传染效应, 它能使股票价格以最快速度收敛至均衡价格。在此基础上, 进一步探讨了资产结构与股价波动之间的关系。具体而言, 在理性传染效应的作用下, 当市场中满仓交易者数量与空仓交易者数量相当时, 股价呈现小幅水平趋势波动; 当满仓交易者数量远高于(低于)空仓交易者数量, 股价呈现大幅下跌(上涨)趋势波动。

关键词: [资产结构](#) [股价波动](#) [传染效应](#)

Abstract: According to the behavioral finance experiments with real people, a mathematical model which describes relationship between the average market investment attitude and stock price is constructed. Firstly, the stability of the model is investigated by the related theory of nonlinear discrete dynamic system, and then contagion effect is identified based on whether financial market is stable. Numerical simulations indicate that there exists an optimal contagion effect in the region of rational contagion effect. It can make the stock price convergence to equilibrium price with the fastest speed. Furthermore, the relationship between capital structure and stock price volatility is also investigated in the region. Specifically, under the influence of rational contagion effect, when the numbers of long position traders and short position traders are roughly equal in the market, share price volatility shows a parallel trend with slight amplitude; when the number of long position traders are more (less) than the number of short position traders, share price volatility shows a decline (an upward) trend in huge amplitude.

收稿日期: 2011-08-23;

基金资助: 国家自然科学基金资助项目(71173012)

引用本文:




刘祥东, 刘澄, 王立民. 资产结构与证券价格的非线性动态模型[J]. 中国管理科学, 2012, V20(6): 9-17




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