

摘 要

本論文研究如何由觀測的選擇權市場價格還原風險中立機率測度(等價平賭測度)。首先建構選擇權投資組合的套利模型,其中假設選擇權為單期,到期日時的狀態為離散點且個數有限,並且對應同一標的資產且不同履約價格。若市場不存在套利機會時,可使用拉格朗日乘數法則將選擇權套利模型導出拉格朗日乘子的可行性問題。將可行性問題作為限制式重新建構線性規劃模型以還原風險中立機率測度,並且利用此風險中立機率測度評價選擇權的公正價格。最後,我們以台指選擇權(TXO)為例,驗證此模型的評價能力。

關鍵字：評價選擇權, 風險中立機率測度, 等價平賭測度, 線性規劃。



ABSTRACT

This thesis investigates how to recover the risk-neutral probability (equivalent martingale measure) from observed market prices of options. It starts with building an arbitrage model of options portfolio in which the options are assumed to be in one-period time, finite discrete-states, and corresponding to the same underlying asset with different strike prices. If there is no arbitrage opportunity in the market, we can use Lagrangian multiplier method to obtain a Lagrangian multiplier feasibility problem from the arbitrage model. We employ the feasibility problem as the constraints to construct a linear programming model to recover the risk-neutral probability, and utilize this risk-neutral probability to evaluate the fair price of options. Finally, we take TXO as an example to verify the pricing ability of this model.

Key words: options pricing, risk-neutral probability measure, equivalent martingale measure, linear programming.