摘　　要

本文提出一個新的混合整數線性規劃模型建立投資組合。這個模型所採用的風險函數為最大損失的絕對值，而不是一般常用的損失變異數。在給定的報酬水準下，模型尋找在觀測期間中最小的最大損失的投資組合，即為大中取小的原則。模型也同時考慮實務上常遇見之情況，如：交易成本、最小交易單位、固定交易費用比率、資產總類數等限制。因此，模型內需使用整數變數及二元變數，導致模型的計算求解過程變得比不含整數變數及二元變數的模型困難許多。我們以固定整數變數的啟發式演算法增進求解的效率，並以台灣股票市場的資料做為實證計算的對象。

關鍵字：大中取小原則、投資組合優化、混合整數線性規劃

ABSTRACT

A new mixed integer linear program (MILP) for selecting portfolio based on historical return is proposed. This model uses the downside risk rather than the variance as a risk measure. The portfolio is chosen that minimizes the maximum downside risk over all past observation periods to reach a given return level. That is a mini-max principle. The model incorporates the practical characteristics such as transaction costs, minimum transaction units, fixed proportional transaction rates, and cardinality constraint. For this reason a set of integer variables and binary variables are introduced. The introduction, however, increases the computational complexity in model solution. Due to the difficulty of the MILP problem, a heuristic algorithm has been developed for the solution. The computational results are presented by applying the model to the Taiwan stock market.

Key words: mini-max principle, portfolio optimization, mixed integer linear program