摘　要

通常已建立的指數基金，經過一段時間後其追蹤指數的效能已經無法滿足初期建購時的要求，此時管理者便面臨指數基金投資組合的調整問題。本論文融合建構指數基金的方法及最小化交易成本的概念，提出一個新的混合整數線性規劃模型以調整指數基金投資組合。模型亦考慮實務中交易成本、最小交易單位及批量、固定交易費用比率、以及資產總類數等限制。因此，模型包含整數變數及二元變數，求解也較為困難許多。本論文以啟發式演算法增進求解的效率，並以台灣 50 指數的相關資料做為實證研究的對象。

關鍵字：指數基金、混合整數線性規劃、台灣 50 指數

ABSTRACT

The efficiency of index-tracking in index fund, which has been built, has usually been incapable to meet the needs after a period of time. In this moment, the managers have to face with the problems of the adjusting for index fund portfolio. In this paper, we integrate the methods of constructing index fund and the concepts of minimum transaction cost with it, and propose a new mixed integer linear program model to adjust the index fund portfolio. Moreover, the model also considers some limitations, such as the transaction costs, minimum transaction units and lots, fixed proportional transaction rates, and cardinality constraint in practical operating. For this reason, a set of integer variables and binary variables are introduced. However, they increase 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 50 index.

Key words: index fund, mixed integer linear program, Taiwan 50 index