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運用邊際分析演算法快速建構可有效模擬特定股價指數之投資組合

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由於近年來指數型基金及指數股票型基金大爲風行，且拜電腦程式交易系統益趨精進之賜，使指數型投資及指數投機與套利交易遠較以往活躍，因而更迫切需要一種更能快速建構可模擬特定股價指數之投資組合的有效方法。更明確地說，對於機構投資人或基金經理人而言，當欲建構可模擬特定股價指數績效表現之投資組合時，必須設法開發一種執行簡易且可大幅縮短搜尋時間，並達成可接受之追蹤誤差的搜尋方法。爲達前述目的，本研究嘗試以邊際分析法爲基礎發展出一可快速有效建構出追蹤特定股價指數之投資組合的搜尋與篩選方法，其原因在於，相較與其他啓發式演算法如基因演算法，邊際分析法具有極佳搜尋效率、高度應用彈性及易於瞭解與執行等優異特性，使得邊際分析法特別適用於求解如指數型基金或指數股票型基金等大型基金的投資組合選擇問題。最後，爲了排除市場因素，分別測試與驗證台灣股票市場之一段漲勢及跌勢期間，實證結果顯示邊際分析法確可快速有效篩選及建構出可極佳複製台灣加權股價指數的投資組合，並且發現所建構出之投資組合具有極高的穩健性與可靠性。

關鍵詞：投資組合選擇、模擬股價指數、複製股價指數、邊際分析法。

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Quickly Constitute the Portfolio for Effectively Simulating the Given Stock Index by Using Marginal Analysis Heuristic

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The index-type funds and exchange traded funds have been drastically growing in recent years. Additionally, the index-type investments, and index speculations and arbitrages are more frequent than the past because of program trading system constantly evolving and prevalent. As a result, an effective approach for quickly constituting the portfolio, which can effectively simulate the given stock index, is required. More specifically, the concerned asset management institutes and fund managers presently are in more urgent need of developing a searching approach that can be easily and straightforwardly implemented, greatly reduce searching time and realize acceptable tracking error when they intend to build up the portfolio, which can imitate the performance of the given stock index. To this end, this study aims at developing a marginal analysis-based portfolio selection approach to effectively simulate the given stock index. The reason is that the marginal analysis is generally characterized by significant search efficiency, extensively

applicable flexibility, and relatively easy to implement when comparing to other heuristics. These features make the margin analysis being particularly suitable for large asset management institutes and mutual funds. Finally, a given bullish and bearish periods for Taiwanese stock market are respectively examined in order to rule out market effect. The empirical results show that the marginal analysis is as expected able to easily and quickly build up the portfolio for perfectly projecting the give stock index. Moreover, the tracking capability also is apt to be reliable and stable according to the performance tests.

Keywords: portfolio selection; simulating stock index; tracking stock index; marginal analysis.