應用平滑技術於GM(1,1) 灰色模型之預測系統

林彥宏、王正賢

E-mail: 9126981@mail.dyu.edu.tw

摘 要

灰色預測模式為一適用於短期預測之有效工具，其中，GM(1,1)為灰色預測中廣為使用模型之一。然 而， GM(1,1) 對於波動性明顯之數據資料卻未能有效的掌握其變動趨勢，因此，本研究之目的即在短 期預測之要求下，建構一有效之GM(1,1) 預測方法，而此方法也能對具有明顯波動性之資料達到理想的 預測結果。本研究嘗試從三個不同的觀點對波動性資料進行解析，期望能降低資料之波動性。首先從序 列關係與因素分析的角度探討，分析一時間序列的變動趨勢中，是否有其他序列或非預期因素的發生而 導致序列之波動性增加，而後並將此些訊息移除。其次為從時間序列之特徵角度探討，尤其是對季節性 或週期性的效果進行分解，透過時間序列的分解過程，將季節性或週期性之特徵排除，如此將可大幅改 善序列波動的情況。最後為以平滑曲線之數學方法配適原始資料序列，並以此配適曲線取代原始序列成 為預測過程中之輸入值，期望透過曲線的平滑而提昇預測績效。綜觀上述所示，本研究之目的為以不同 方法改變時間序列之波動性，藉以創造理想的序列型態以提昇灰色預測之運用成效。最後本研究以台灣 股價加權指數為列，說明如何使用上述所示之方法，並應用灰色理論之GM(1,1) 以有效達成短期預測之 目標。

關鍵詞 : 灰色理論、股價預測、因素分析、序列分解、平滑技術

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