整合時間序列資料與總體經濟變數於失業率預測之應用

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摘　　要

最新的一季度，2004 年 2 月的就業不足率維持在百分之三點四。與此去年失業人數減少了五百人至二十四萬九千人。就業不足人數則增加了一千三百人至十二萬人。雖然上一季度就業人數輕微下降，但勞工市場保持活躍。與新加坡之失業率相比相當 4.41%，但比南韓之 3.4% 相比偏高，失業率是現今政府重大課題。本研究提出一整合多元適應性雲形迴歸及類神經網路之二階段模式，同時使用失業率的歷史資料以及總體經濟變數資料來建構失業率預測模型。運用多元適應性雲形迴歸(MARS)針對可能影響失業率之變數進行篩選，之後將篩選所得之變數作為類神經網路模式之輸入變數，希望能提供類神經網路一個良好的起始原點(better initial solution)，再透過類神經網路的學習、辨識能力，以縮短模式訓練所需時間，進而得到較佳之預測結果。試圖將以台灣地區 1997 年 10 月至 2002 年 9 月共計 60 筆之月失業率資料，進行二階段整合模式實證分析。實證結果顯示，二階段整合模式有優於單純使用多元適應性雲形迴歸以及類神經網路兩方法之預測結果。此外，本研究亦驗證同時使用失業率歷史資料以及總體經濟變數可以增加失業率預測的準確度。

關鍵詞：失業率、多元適應性雲形迴歸、類神經網路、預測、**ARIMA**

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Using Time Series Data and Macroeconomic Variables in Unemployment Rate Forecasting

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Abstract

The purpose of this research is to propose a two-stage unemployment rate forecasting model in integrating backpropagation neural network (BPN) and multivariate adaptive regression splines (MARS). Unlike past studies only use either past observations or socioeconomic variables in building the forecasting model. This paper tries to incorporate both past observations and socioeconomic variables in building the model. As to the modeling procedure, MARS is firstly used to build the unemployment rate forecasting model with the obtained significant variables as the input nodes of the designed BPN model aiming to improving the forecasting accuracy.

In order to verify the effectiveness of the proposed two-stage modeling procedure, the monthly unemployment rate from September 1997 to October 2002 was used as an illustrative example. Empirical results indicate that the integrated approach provides significant better forecasting results than solely using BPN, MARS, and ARIMA models. Besides, we also observed that considering the historical data of unemployment rate and macro economy variables at the same time would improve the accuracy of the forecasting model.

Key words：multivariate adaptive regression splines, neural networks, unemployment rate, forecasting, ARIMA

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