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摘要(中) 類神經網路對財務時間序列之預測具有極優之潛力。在類神經網路的預測過程中，必須先有一組已發生的歷史數據作為其訓練學習運算之基礎。由於在財務時間序列數據中，無可避免的存在一些雜訊，這些雜訊十分不利於類神經網路預測結果的準確度。本研究採用獨立成分分析作為濾除財務時間序列雜訊之工具，在啟動類神經網路前，先運用獨立成分分析找出訊號之雜訊，並予以去除。2005 年 12 月 16 日到 2008 年 8 月 20 日的日圓和美元間之匯率做為實證研究之主題。前三天的匯率作為輸入之預測變數，以預測第四天之匯率。預測之準確度採用六項評估指標，包括 RMSE、NMSE、MAD、DS、CP 和 CD 來予以衡量。研究結
果顯示，獨立成分分析法可以有效的移除財務時間序列中的雜訊，並可提高預測的準確度。因此，獨立成分分析法十分適合與類神經網路結
合，可作為類神經網路運算之前置程序，可有效移除財務時間序列中的
雜訊，提高類神經網路之預測準確度。本研究亦探討預測輸入變數個數
對預測準確度之影響，經由採用前三天之資料預測第四天匯率，以及以
前四天之資料預測第五天匯率結果之比較，發現以前三天之資料預測第
四天匯率之預測準確度，遠較以前四天之資料預測第五天匯率之結果為
佳，此應與財務時間序列之變化相當劇烈，預測之輸入資料時間範圍愈
長時，愈有可能涵蓋較多之劇烈變化，而這些劇烈變化將十分不利於類
神經網路運算之預測準確度。

摘要
(英)
The artificial neural networks (ANN) show good potential for forecasting future
changes of financial time series. ANN requires the historical data as input sources,
based on which the training and testing processes could be carried out within the
algorithm. Unfortunately, the noisy information is unavoidably inherent in the
financial time series data, which causes detrimental influence on the predictive
accuracy. The present study uses independent component analysis (ICA) as a pre-
process to resolve the noisy information and remove it before the data are
provided to start the ANN analysis process. The FX rate between Japanese yen
and US dollar from December 16, 2005 to August 20, 2008 is chosen as the
illustrated and empirical study. The exchange rates of the previous three days are
used as the three predictive variables for predicting the forth day’s exchange
rate. Six evaluation indices, including RMSE, NMSE, MAD, DS, CP and CD, are
used to evaluate the predictive performance. From the results, it is verified that
the ICA can effectively remove the noisy signal in the financial time series, and
improve the predictive accuracy as well as the prediction of the change direction.
ICA is concluded as a good pre-processing tool while ANN is chosen as the
predictive method. The present study also carries out the investigation about the
effects of the predictive variable number on the forecasting performance. Through
the comparison of the results from the case with three predictive variables (using
previous three days’ data to predict the forth day’s data) and the case with
four predictive variables (using previous four days’ data to predict the fifth
day’s data), it is found the former case shows the significantly better predictive
performance. The reason to cause the result is suspectedly attributed to the violent
change existing in the financial time series. As the duration of the predictive data
extends to a longer period, the more fluctuation would be covered in the input
data, which is detrimental to ANN training process and achieving the good
predictive performance.

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