

## PARTICLE SWARM OPTIMIZATION BASED ON BACK PROPAGATION NETWORK FORECASTING EXCHANGE RATES

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**ABSTRACT.** *This research constructs a new forecasting model. Particle Swarm Optimization (PSO) is utilized to select the optimal input layer neurons, and then predict exchange rates by the Back Propagation Network (BPN), which called PSOBPN model. The model is applied to forecast exchange rate NTD/USD. We hope to improve traditional neural network that utilized the try-and-error method to find out the better neurons of input layer efficiently. The results show that the PSOBPN achieves the best performance forecasting and is most closely matched with the actual exchange rate.*

**Keywords:** Particle swarm optimization, Back propagation network, Exchange rate forecasting

1. **Introduction.** Since the collapse of Bretton Woods Agreement in 1973, every country gave up traditional fixed exchange rate and started to accept floating exchange rate in the world. In floating exchange rate system, it is possible for every country that its exchange rate often drastically moves. Therefore, the issue about prediction of exchange rate becomes very important. How to predict future exchange rate correctly is an important mission for multinational corporations.

There are some exchange rate prediction models in tradition such as Monetary Model, Portfolio Balance Approach Model theory, Purchasing Power Parity Model and Balance of Payment Approach Model. These approaches are often adopted to predict the exchange rate. Fang and Kwong (1991) compared ARIMA with economic model to forecast foreign exchange rate, and their result showed that the economic model had better performance for the prediction. Chang (1991) used OLS method and the ARIMA model integrated with macroeconomic model and prediction combination model and then observed their forecast effect. The practical result showed that the long-term prediction effect was better than the short-term when using the macroeconomic model. Although the macroeconomic model integrated with ARIMA model could consolidate the prediction effect of macroeconomic model, the effect was not significant and that forecast combination model could even increase prediction effect. Wei (1994) used ARIMA, economic model and forward currency model with rolling regression method to forecast the exchange rate of CAD/USD, JPY/USD, Pound/USD and DM/USD. The result showed ARIMA had the strongest prediction ability of all models in the short term, and the economic model in the long term. Mehran and Shahrokhi (1997) used Mean Absolute Error (MAE), Mean Square Error