

# Foreign Exchange Rate Prediction using Artificial Neural Network and Sentiment Analysis

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## Abstract

Foreign currency exchange plays an important role for currency trading in the financial market. Modern approach to the foreign currency exchange market requires support from the computer algorithms to manage huge volume of transactions. There occurs problems like trading without a plan, failing to adapt to the market, having unrealistic expectation and many more. Due to these problems, predictions are to be done. This paper investigates on prediction of foreign exchange market using neural network and sentiment analysis. There are many algorithms for performing prediction but different algorithms have different accuracy. One of the best method with high accuracy is given by Artificial Neural Networks (ANN). Neural network parameters include number of hidden layers, number of neurons, use of bias neurons, activation functions and training methods. Input nodes are price of gold, crude oil, Nasdaq index, yesterday's price. Our model contains 4 input node, 1 hidden layer and 7 hidden nodes. At first, pre-processing is done and inputs are fed to the neural network. By using backpropagation algorithm, training is done and then testing is performed. Mean absolute percentage error is found to be 0.39%. The price movement is also directly related to market sentiment. We aim to employ a statistical technique to the opinion of different traders and finding the overall sentiment. Sentiments are taken from tweets and then filtering the tweets are performed. After that, features are extracted and by using Naïve Bayes algorithm, the results are classified as positive or negative.

**Keywords:** *Foreign Exchange Rate, Back propagation algorithm, Naïve Bayes algorithm*