Exchange Rate Modeling and Forecasting via Ensemble Machine Learning Methods

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Abstract

The goal of the research is to predict the USD/JPY exchange rate. In order to do this, CART Ensembles and Arcing approach have been used to create high-performance machine learning models. The index of unemployment in the US and Japan, inflation in both countries, and other important macroeconomic indicators have also been studied. The lagged variables are appropriate for the model's predictors, according to a thorough examination of their time series. Official monthly data from October 1987 to September 2024 have been examined. The built CART Ensembles and Arcing models explained up to 96% of the data with 1% MAPE. The extent to which the macroeconomic indicators under consideration impact the USD/JPY exchange rate has been determined. Forecasting one month ahead has been done using the models. The proposed approach could be useful for budgeting, currency risk hedging, and professional trading.

Keywords

CART-Ensembles and Arcing, machine learning, key macroeconomic indicators.