Currency Exchange Rate Forecasting with Social Media Sentiment Analysis

Akıner Alkan[1] and Ali Fuat Alkaya[2]

[1] Siemens, Istanbul, Turkey
[2] Marmara University, Engineering Faculty, Computer Science and Engineering Department, Istanbul, Turkey

Abstract

Social media has been increasingly popular and valuable along with their mass data. As we know; currency exchange rate forecast has been an important topic for researchers, analysts, and investors for a long time. In this study, we have combined exchange rate time series analysis and Twitter sentiment analysis to build a machine learning model. We have built the model in three stages for a six months period: (i) we have watched financial and political hashtags and applied sentiment analysis on the tweets retrieved from these hashtags, (ii) we have collected time series data on cross-currency exchange rates including cryptocurrencies, (ii) we have optimized the model to forecast USD / TRY with the data we have. We have experimented with several machine learning algorithms including linear regression, Bayesian ridge, support vector machines along with multi-layer perceptron (MLP). It has been observed that in this novel approach, some legacy machine learning methods performed better than MLP. Computational experiments showed that our approach gave up to 0,1% mean squared error performance. Results suggested that sentiment analysis is a helping factor to forecast currency exchange rate and Twitter is a good data source due to its mass and interactivity. In conclusion, investors, analysts, and researchers can benefit from the usage of our proposed model and will able to get strong and consistent results to forecast the USD / TRY currency exchange rate.

Keywords: machine learning, natural language processing, time series analysis, social media