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Vox populi, vox Dei? Impacts of Fintwit's Sentiments on Brazilian Interest Rate using Machine Learning Forecasting Models

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Introdução

The Focus bulletin can be highlighted among the sources used to form the Brazilian interest rate expectation. Focus is published weekly by the BCB and contains a summary of the daily projections from Brazilian institutions over critical indexes of economy, such as inflation, exchange rate, GDP, and Selic rate goal. Comments published on Twitter, a platform that contain more than six thousand posts per second, became object of study of those who seek to analyze subjects such as finance, politics, and sports, extracting from the social media reactions, sentiments, and opinions from the agents.

Problema de Pesquisa e Objetivo

We aim to analyze the predictive capability of the comment's sentiments from the financial environment published on Twitter about the Selic rate. To model this expectancy and to assess the forecasting capability of the Fintwit over the Selic rate, we collect comments related to the rate from Twitter's financial community, focusing it on publications made close to the Monetary Policy Committee (Copom) meetings during 2021 that determines the Brazilian free risk rate.

Fundamentação Teórica

The international literature is prolific regarding models that forecast the future evolution of the interest rate. Brazilian economic agents' forecasting and expectations over the short-horizon Selic rate are based, in part, on the Focus report published by BCB. Additionally, the use of news and investor sentiment as a tool to aid decision-making is well explored in the literature (Da et al., 2011, 2015). The analysis of publications on social media has been used as a proxy for the population's feelings (Corea, 2016).

Metodologia

The forecasting models and comparison will be made with three models: (i) Linear Regression (LR); (ii) Support Vector Machines, and; (iii) Recurrent Neural Networks. In order to evaluate the sentiment's inclusion effect, we estimate models with a few combinations: (i) considering as input the exchange rate and Ibovespa index (Brazilian stock market performance proxy), isolated and united, and; (ii) adding to the inputs the sentiment from Twitter comments to each one of the models. Thereby, we can measure the effects of publication sentiments information over the forecasting models.

Análise dos Resultados

Six different combinations of input variables were considered in the models. From the analysis of the Fintwit publication sentiments, we could identify four patterns of the community behaviors in the periods of Copom meetings. After all, the sentiment level observed in twitter posts inclusion improves the measures of error. SVM presented the best fit, and the most substantial improvements when the publication sentiments were added. However, unlike the two previous studies, the best model for the Brazilian interest rate was the SVM instead of the neural networks.

Conclusão

We could identify four patterns of the community behaviors in the periods of Copom meetings that decided on the Brazilian interest rate: (i) Fintwit becomes, as expected, more active during Copom meetings when the terms: Selic, Copom, and; inflation; (ii) publications become more positive during

the two-day meeting; (iii) posts become more negative in the days following the meetings, and; (iv) Fintwit is generally more divided on the day of the second meeting and the day after it.

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