Inflation Forecasting in WAEMU Zone: ARFIMA Model versus Machine Learning Models

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Abstract: This paper focuses on the effective prediction of inflation in the WAEMU zone by comparing the predictive performance of various models: penalized regression models (Lasso, Ridge, Elastic Net), LSTM neural model and traditional econometric model. Unlike previous works which use the ARIMA model as a classic econometric model, our study uses an ARFIMA model. Indeed, the predictive power of the ARIMA model is systematically reduced, thus biasing the comparison with the LSTM neural network model. The empirical results, based on a historical series of price levels in the WAEMU over the period January 1997-September 2024, confirm the predictive superiority of the LSTM model over the ARFIMA models and penalized regression models. On the other hand, the LSTM model is dominated by the Ridge model. The study recommends that the BCEAO use AI/ML models to predict inflation in the WAEMU, whose structural weaknesses in the financial system *a priori* complicate any prediction of the price level.

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