Multivariate Chaotic Time Series Prediction of CDS Risk Premium with Superforecasters on BRICS and MI[N]T Countries

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Abstract:

Credit Default Swap (CDS) has become more popular, especially after the 2008 US financial crisis, and is protection that an investor buys in the case of credit default. The CDS risk premium that has to be paid against default increases along with the probability in default. In recent years, the CDS market of emerging countries ensures attractive investment opportunities for international investors. Theoretically, holding a risk-free bond and holding a risky bond with CDS should yield the same amount since both are default-risk free. However, despite what the theory suggests, the equality might not hold due to the market imperfections, liquidity conditions, and increased global integration among the financial markets. Although there is a wide literature that focused on explaining the determinants of CDS premium, the studies focusing on forecasting is limited and considered as a univariate context. This research aims to break its hard-forecastability by changing the methodology from univariate to multivariate. The data covers the years between 2009 and 2019 with daily frequencies. Since Nigeria has not taken participation in the CDS market, BRICS and MI[N]T coverage have eight countries for each variable. Again, each country's CDS premium was predicted by using state-of-the-art superforecasters in deep learning techniques such as ERNN, NARXRNN, GRU, LSTM and ConvLSTM, which are recent ground-breaking forecasters in the time series setting. The prediction power of each superforecaster was analyzed by using mean forecast error, mean absolute error, and mean absolute percentage error. According to the results, there is some differentiation in both the type of superforecaster and the country; compared to other algorithms, LSTM performs quite well, gaining dominance as the best predictor over othepremiurs.

Keywords: cds forecast, time series, deep learning, lstm networks

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