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Predictive Optimized Model on Money Markets Instruments With Capital Market and Bank Rates Ratio

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ABSTRACT

The money market and the capital market of the Indian financial markets have a symbiotic relationship in the development of the Indian economy. The nature and the characteristics of the markets differ to a large extent as the money market ensures liquidity in the system through the monetary policy by the regulators; capital markets propel and act as the engine driver for the economy in the long term. Therefore, the final throughput of the economy is the aggregation of the output of both the markets. Does that imply that the development of both markets is parallel in nature or is any one superior to the other or are they competitors? To understand the influence of one over the other the research was undertaken through a correlation matrix and time series model. A predictive model was further constructed for predicting the volume of money market instrument on the basis of fourteen days historical.

KEYWORDS

Bank Rates Ratio, Capital Market, Correlation, Data Science, Machine Learning Model, Money Market Instruments, Regression Analysis, Time Series Analysis

1. INTRODUCTION

As per the business standards, money market achieve tremendous growth in Indian financial markets just after the globalization initiative in the year 1991. Due to the advantages like high liquidity, borrowing or lending short term funds for a short time or a long time, diversity in interest rates and dichotomy in nature, popularize the market to gain the trust of the investors. To invest in Money Market, it provides various instrument options, for example, call money market (CMM), treasury bills (T-Bills), certificate of deposits (CDs), commercial papers (CPs), and money market mutual funds (MMMF). Due to this diversification in the market, it facilitates economic growth in India for the past few years.

Money Market and Capital Market focuses on trading of currencies and used to determine the flow of financial assets in monetary areas. So, there might be chances of having an either positive correlation or negative correlation among them. This can also be applicable in finding the relationship between

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bank rate ratios and money market instruments. This will basically prove that one of the variables, are dependent on any of another variables. Bank rate ratios, such as, cash reserve ratio (CRR), policy repo rate (PRR), and reverse repo rate (RRR) holds a significant position for impacting on each sector of countries economy. Hence changes in these ratios will definitely impact the financial markets.

The volume of money market instruments changes independently with respect to time, hence it can be observed that volume of data may contain some trends or anomalies. Therefore, to check their stationarity in the data, time series model can be built which will help to identify those trends, and anomalies and to forecast for the future price.

In the end, merging these data with proper fortnight day transactions, a machine learning model is built which will predict the volume of money market instruments based on capital market value and bank rates ratio. All the statistics which will affect these variables will be interpreted.

2. LITERATURE REVIEW

There are numerous research studies that use similar indicators to forecast the direction of the stock market index. Much related work has been done on time series and modelling. A few reviews validated that machine learning and modelling have been the best technique to predict stock prices.

Ngabesong and McLauchlan (2019) "Implementing 'R' Programming for Time Series Analysis and Forecasting of Electricity Demand for Texas, USA" forecasted electric supply for Texas on the basis of historical data of one year on a one-point data from September 2016 to August 2017. The Auto Regressive Integrated Moving Average (ARIMA) model was used to estimate future predictions of electricity demand for Texas. It was concluded that the electricity demand would be on the rise for the next year and could also predict when peak shaving would be required.

Chauhan (2019), in his article on "Stock market forecasting using Time Series analysis" used the dataset consists of stock market data of Altaba Inc. which was retrieved from kaggle.com. from the year 1996 to 2017 for analysis. The Box Jenkins methodology (ARIMA model) was trained and predicted the stock prices on the test dataset.

Waqar et al (2017), "Prediction of Stock Market by Principal Component Analysis" conducted experiments on high dimensional spectral of 3 stock exchanges namely New York Stock Exchange, London Stock Exchange and Karachi Stock Exchange. The trend of three stock exchanges by using linear regression as a classification model and further to test the accuracy Principal component analysis, PCA was applied to predict the trend.

Roy et al. (2015), in their research paper "Stock Market Forecasting Using LASSO Linear Regression Model" proposed that the unique method of predicting financial market behaviour which was found to be far superior to the ridge linear regression model was through the Least Absolute Shrinkage and Selection Operator (LASSO) method based on a linear regression model. The model was experimented on the Goldman Sachs Group Inc. stock.

Mingyue and Yu (2016), in their research article "Predicting the Direction of Stock Market Index Movement Using an Optimized Artificial Neural Network Model" demonstrated that their model was most accurate to predict the direction of the next day's price of the Japanese stock market index with maximum accuracy by using the hybrid GA-ANN model. The authors applied two types of technical indicators to predict the direction of next day's Nikkei 225 index movement by adjusting the weights and biases of the ANN model using the GA algorithm and then tested the performance of the GA-ANN hybrid model by applying these two types of input variables and comparing the predictions with actual data.

Deng et al. (2011), "Combining technical analysis with sentiment analysis for stock price prediction" introduced a stock price prediction model. The stock price movements were modelled as a function of these input features and was solved as a regression problem in a Multiple Kernel Learning regression framework by them. The model extracted features from time series data and social networks for prediction of stock prices and Stock Market Forecasting using LASSO Linear Regression Model 373.

Data Visualization of Big Data for Predictive and Descriptive Analytics for Stroke, COVID-19, and Diabetes

Richard S. Segalland Soichiro Takashashi (2023). *International Journal of Big Data and Analytics in Healthcare (pp. 1-31).*
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