HAMOYE

SELENIUM

HDSC PREMIERE PROJECT

FORECASTING FX RATES (2000 – 2019)

27TH AUGUST 2022

PRESENTERS

- ABDULHAMID IBRAHIM
- VISHAL GARG

AGENDA

1 OBJECTIVE

2 OUR APPROACH

3 EDA / ML MODEL

4 CONCLUSION

OBJECTIVE

THE OBJECTIVE IS TO PRODUCE DIRECTIONAL FX FORECASTS THAT ARE ABLE TO YIELD PROFITABLE INVESTMENT STRATEGIES. HENCE, WE APPROACH THE PROBLEM WITH THE FOLLOWING MODELS:

A) LOGISTIC REGRESSION
B) ARIMA
C) FBPROPHET

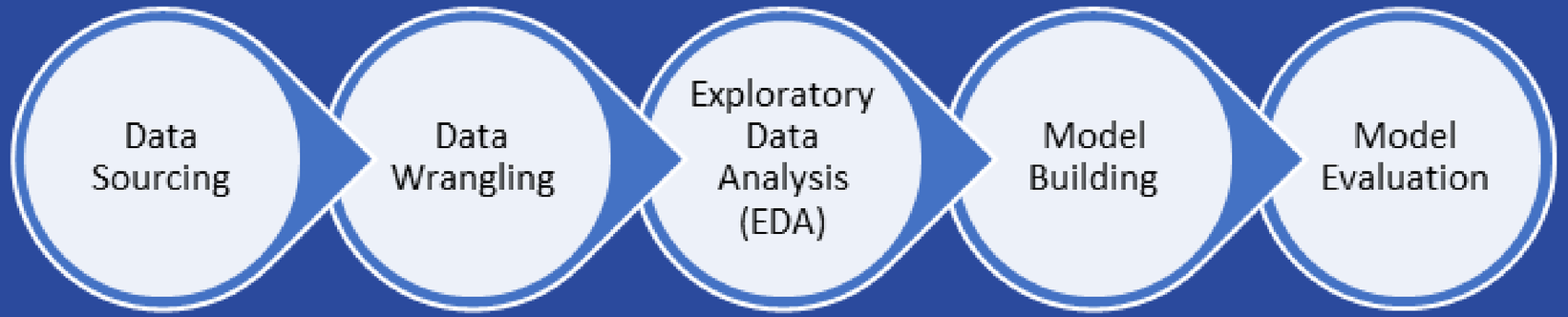
THE MULTIPLE MACHINE LEARNING ALGORITHMS GENERATED FORECASTS SOLVE A SINGLE PROBLEM BY DESIGNING A PROFITABLE FX STRATEGY.

OUR APPROACH

WE CONDUCTED A TIME SERIES ANALYSIS AND BUILT 3 MACHINE LEARNING MODELS TO PREDICT FUTURE VALUES AND GOT THE BEST PERFORMING MODEL IN TERMS OF LEAST ERROR.

- Linear Regression
- ARIMA
- FBProphet

WORKFLOW


Data Sourcing
Data Wrangling
Exploratory Data Analysis (EDA)
Model Building
Model Evaluation

DATASET DESCRIPTION

- THE DATASET USED FOR THIS PROJECT WAS OBTAINED ON THE KAGGLE WEBSITE..
- THE DATASET CONTAINS CURRENCIES WITH THEIR RATES AGAINST US DOLLAR (US$).

DATA WRANGLING

Original Dataset

- .shape() method was used to find out the number of rows and columns in our dataset.
- There are a total of 5,217 rows and 24 columns.

Dropping Columns

- .dropna() was used to drop unidentified columns.
- Column (Unnamed:0) was removed.

Dropping rows

- We dropped an unknown variable 'ND', which was in place of exchange rates.
- As per our analysis, ND stands for 'No Data'.

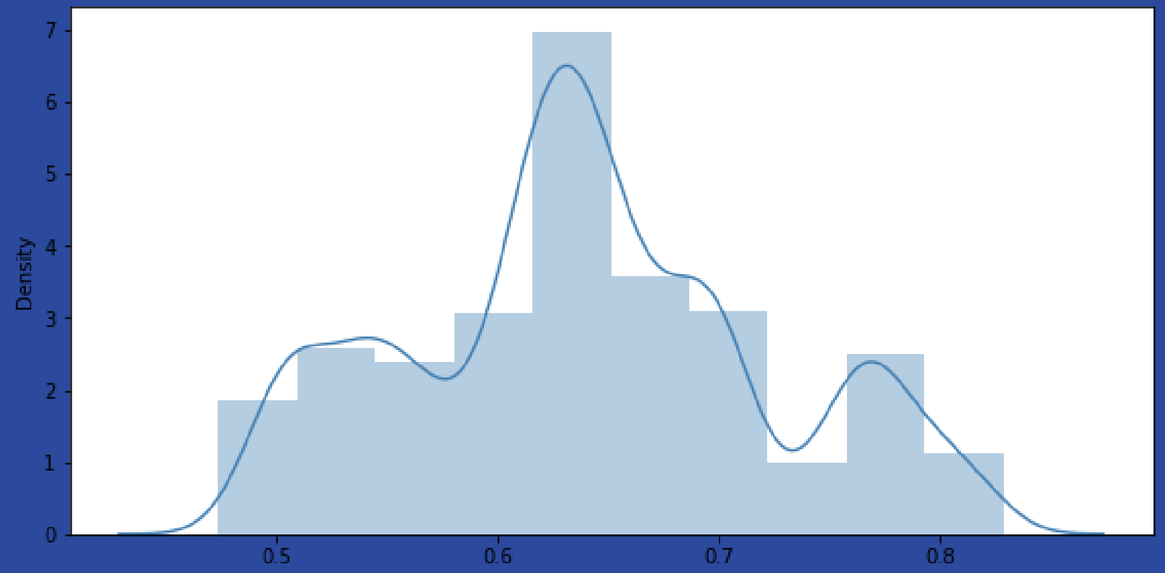
Convert Datatypes

- We observed that the variables had an Object datatype.
- We converted the rates to numeric using .to_numeric() and converted dates to datetime using .datetime().

EXPLORATORY DATA ANALYSIS

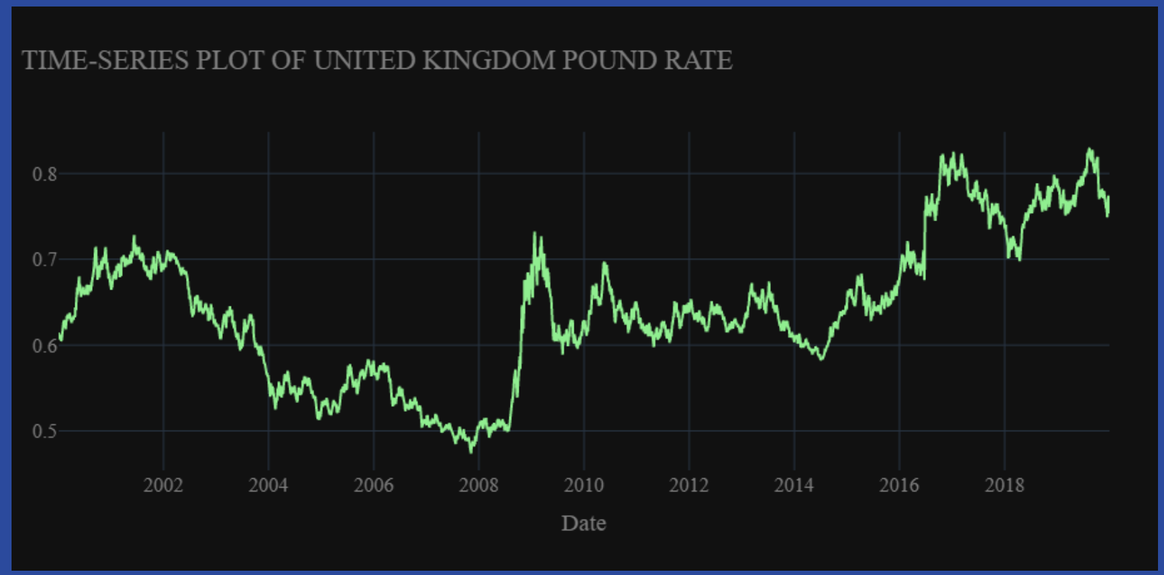
DENSITY PLOT

The density plot follows a guassian distribution pattern as it is bell-shaped in nature.



TIME-SERIES PLOT

- *The line plot shows non-stationary, with a trend and no observable Seasonality.*
- *UK pound appreciated in 2008 and depreciated around 2017.*

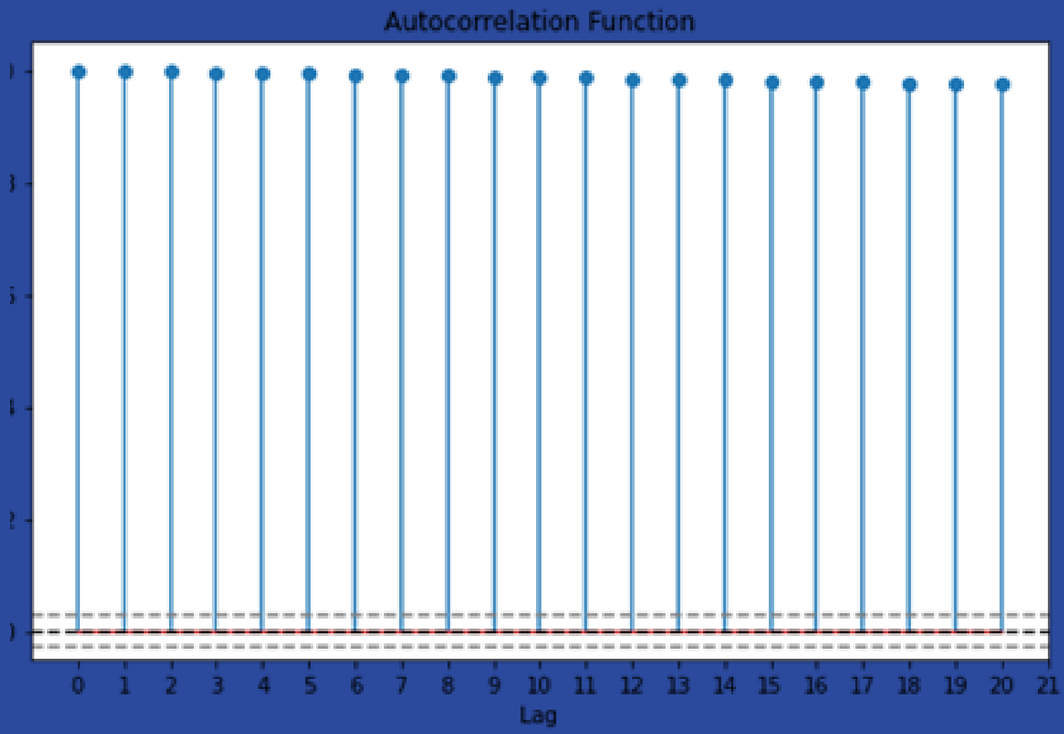


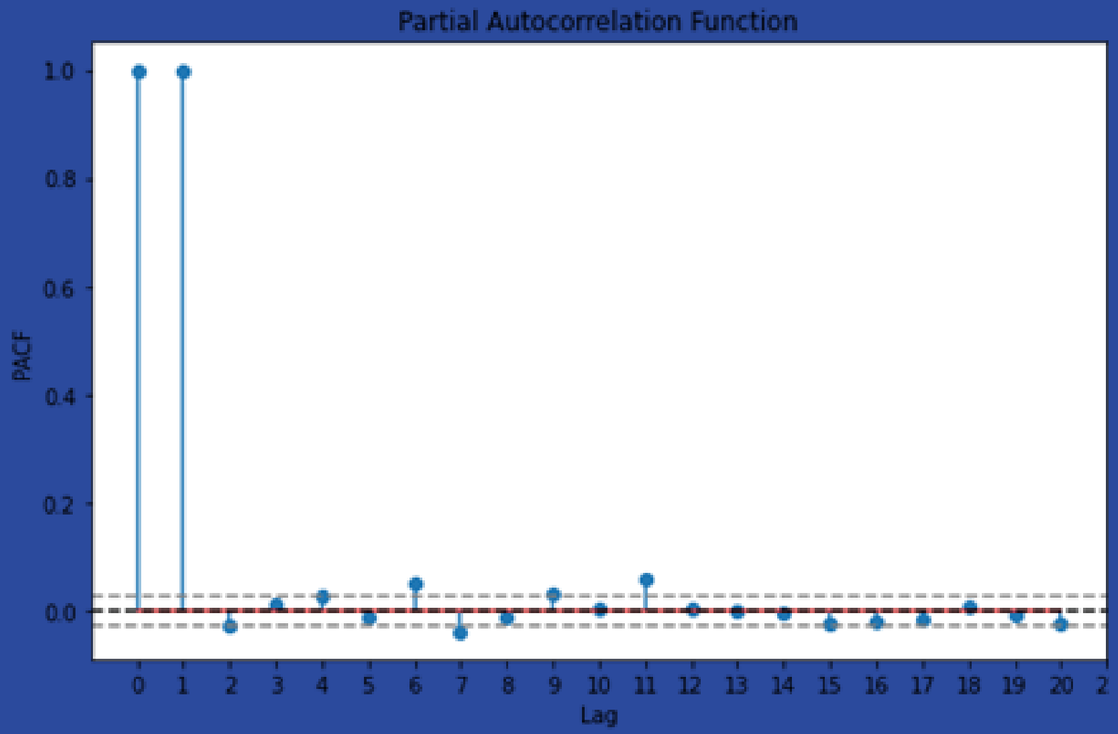
ADF STATISTIC, P-VALUE AND AUTO CORRELATION & PARTIAL ACF

```
ADF Statistic: -1.219928
p-value 0.664965
Critical Values:
        1%: -3.432
        5%: -2.862
        10%: -2.567
```

ACF and PACF plots of GBP data series before differencing.

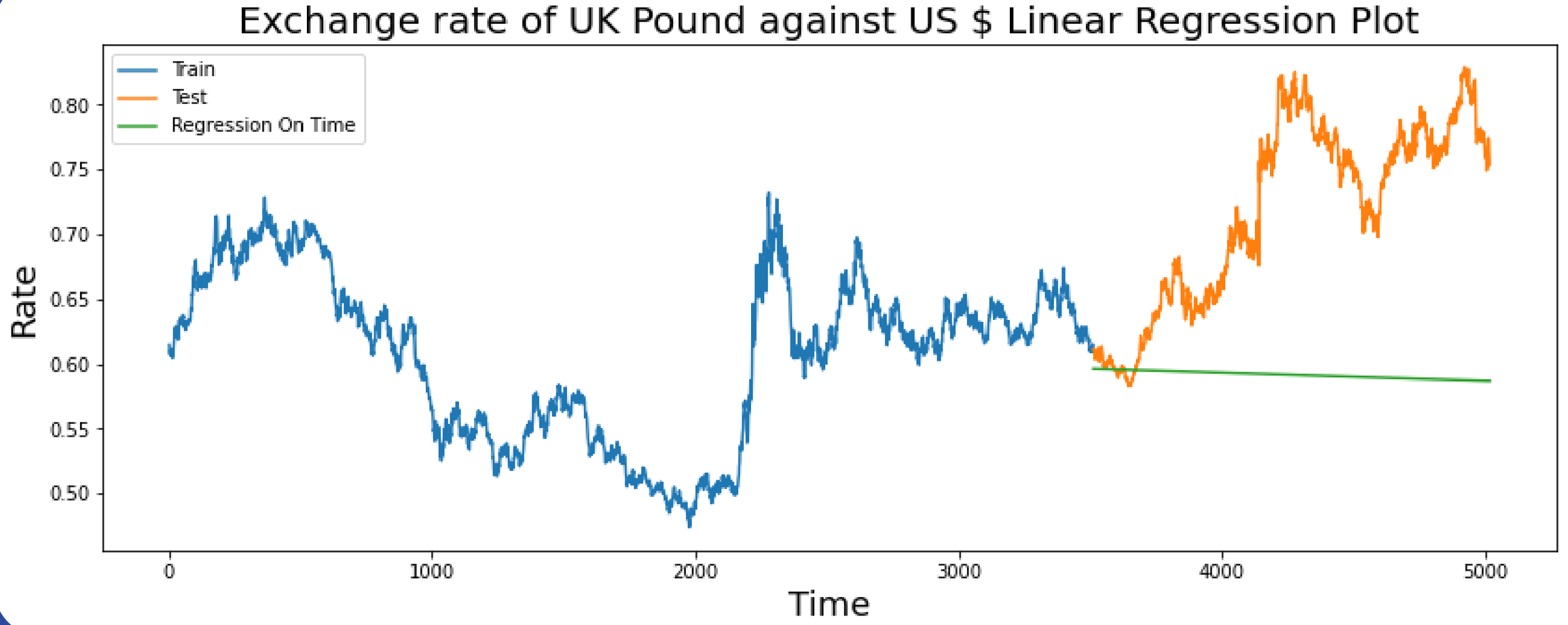
The p-value obtained is greater than the 0.05 threshold from the ADF test.





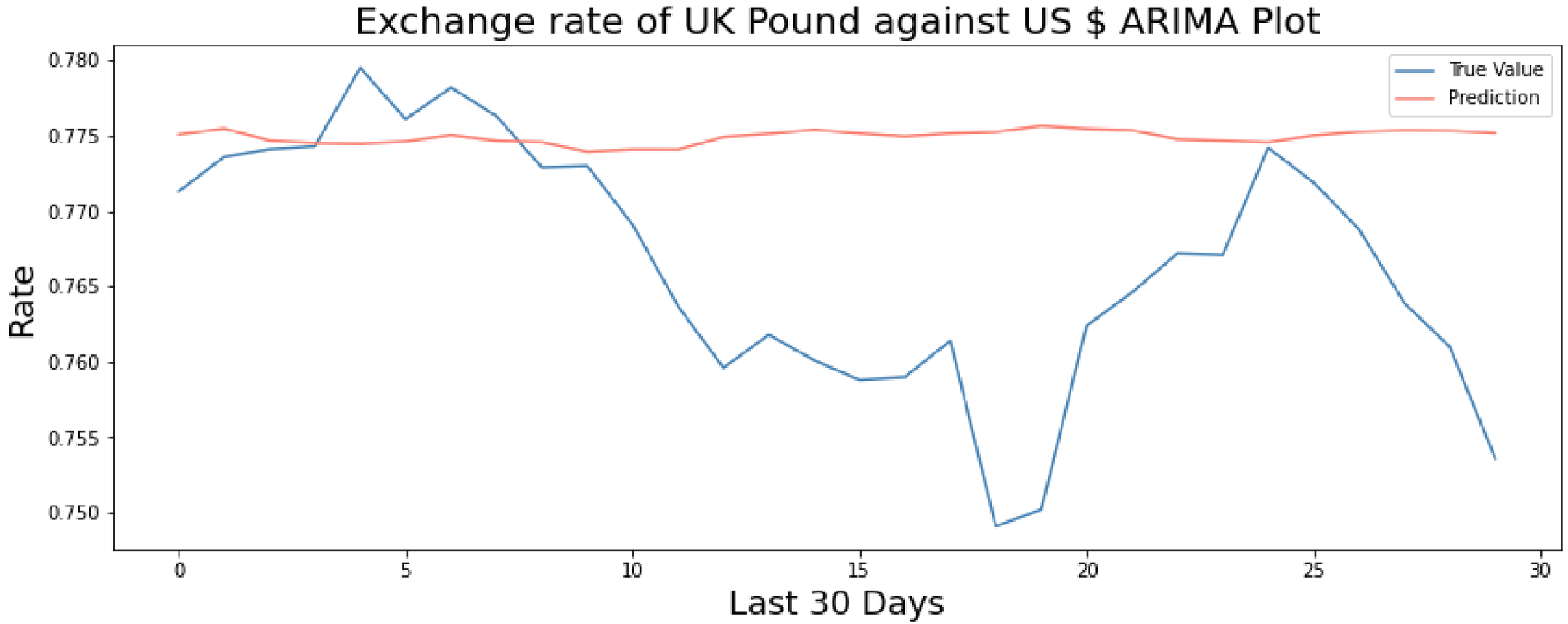
LINEAR REGRESSION MODEL

PREDICTION GRAPH



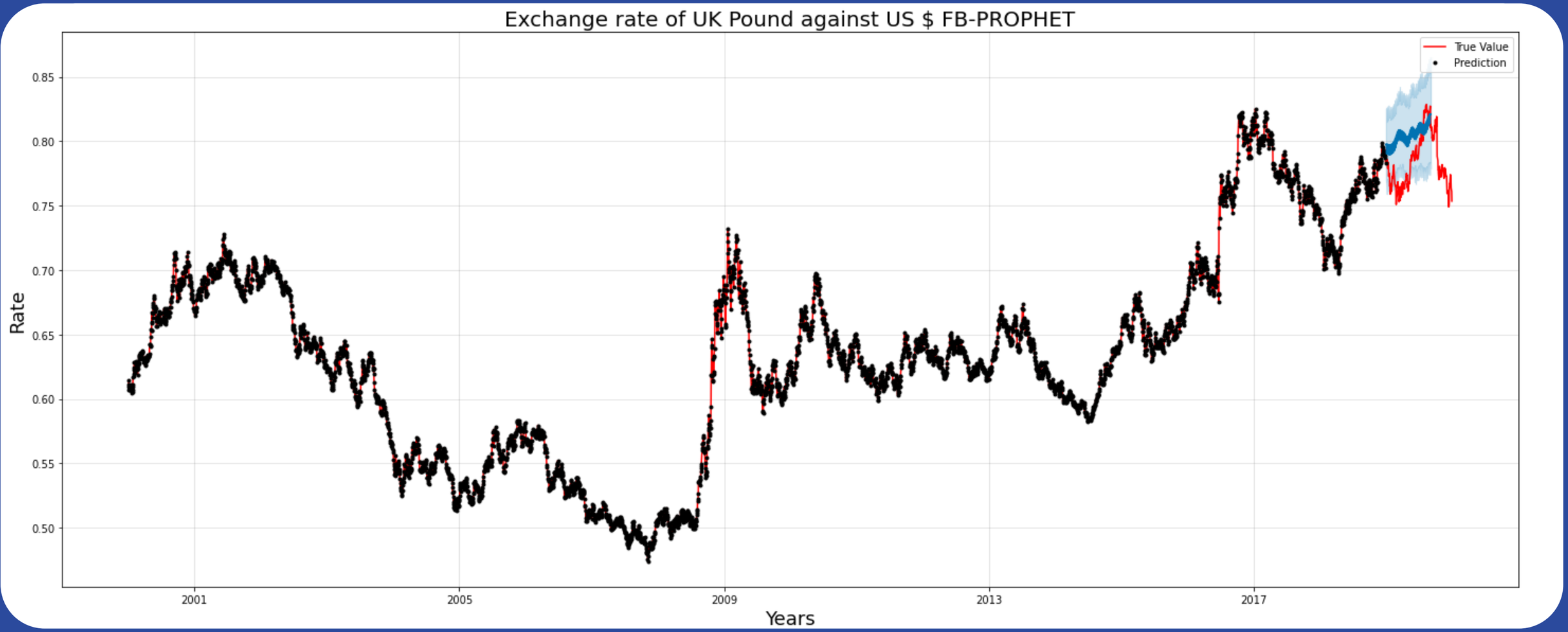
ARIMA MODEL

TRUE VALUE AND PREDICTION OF FUTURE EXCHANGE RATES



FBPROPHET MODEL

PREDICTION GRAPH



RESULT ANALYSIS

	Linear Regression	ARIMA	Prophet
Mean Absolute Percentage Error	16.82%	1.20%	3.30%
Mean Absolute Error	0.12699153	0.00911963	0.02552403
Mean Squared Error	0.02134323	0.00013793	0.00091429
Root Mean Squared Error	0.14609323	0.01174423	0.03023724

SUMMARY

- OF THE THREE MODELS, ARIMA MODEL HAS HIGHEST ACCURACY FROM ALL THE PERFORMANCE EVALUATION METRICS USED.
- THE ARIMA MODEL ALSO PREDICTED A DEPRECIATION IN THE UK POUND EXCHANGE RATES WITH DOLLAR FOR THE LAST 30DAYS.

THANK YOU