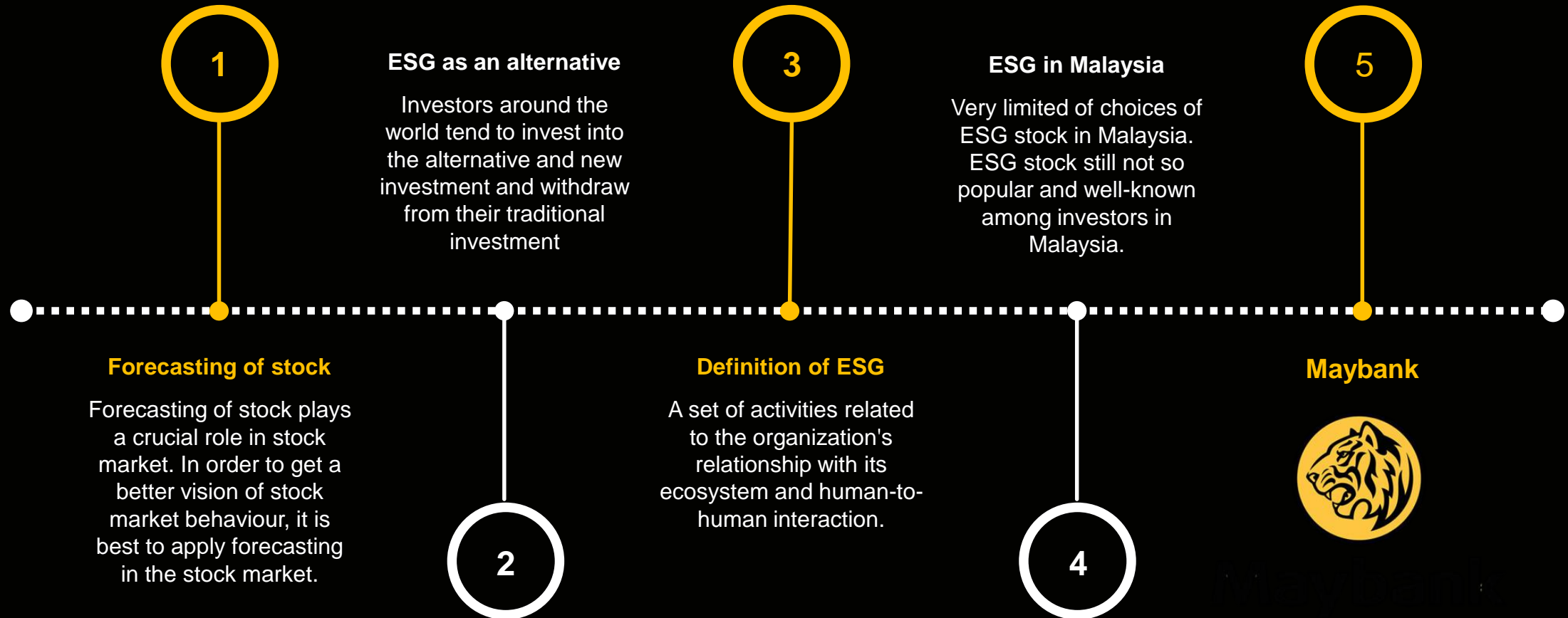




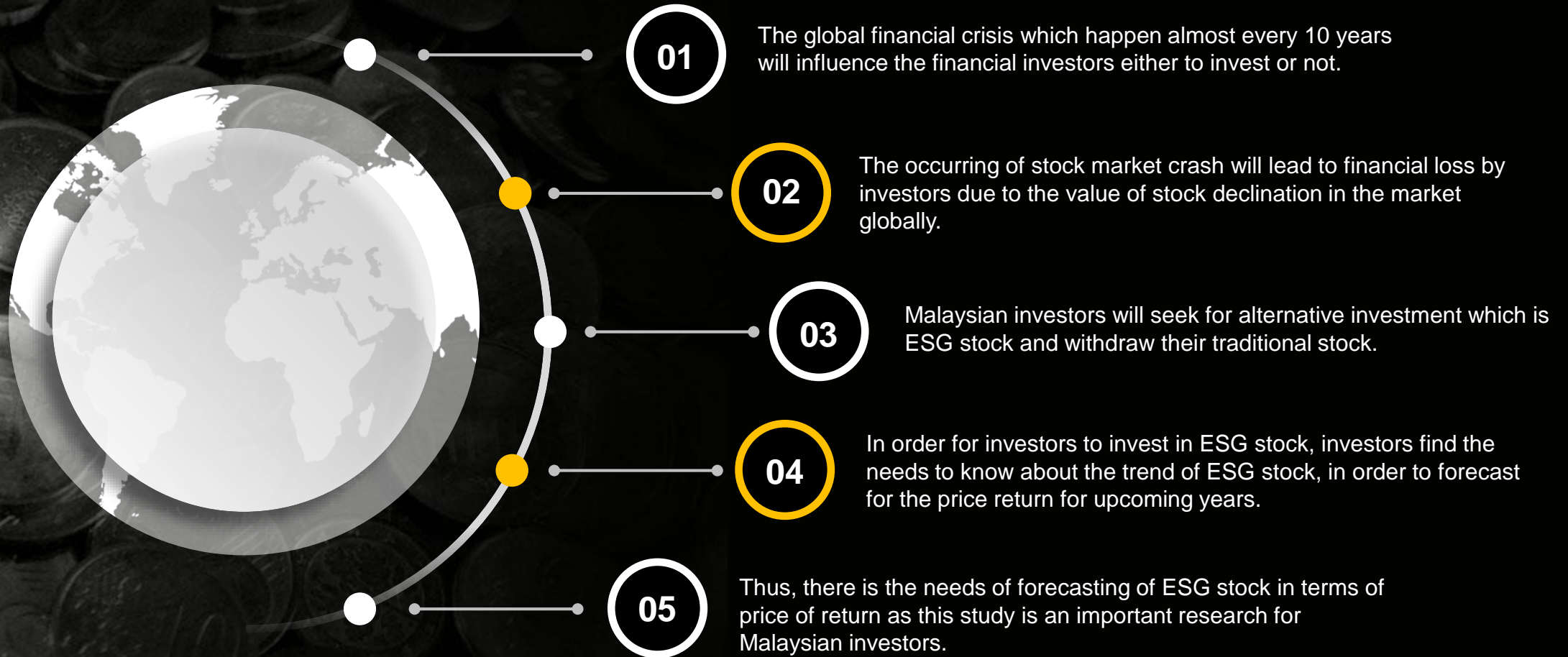
Forecasting of ESG Stock

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Anis

Introduction



Problem Statement



Research Objectives



01

Objective 1

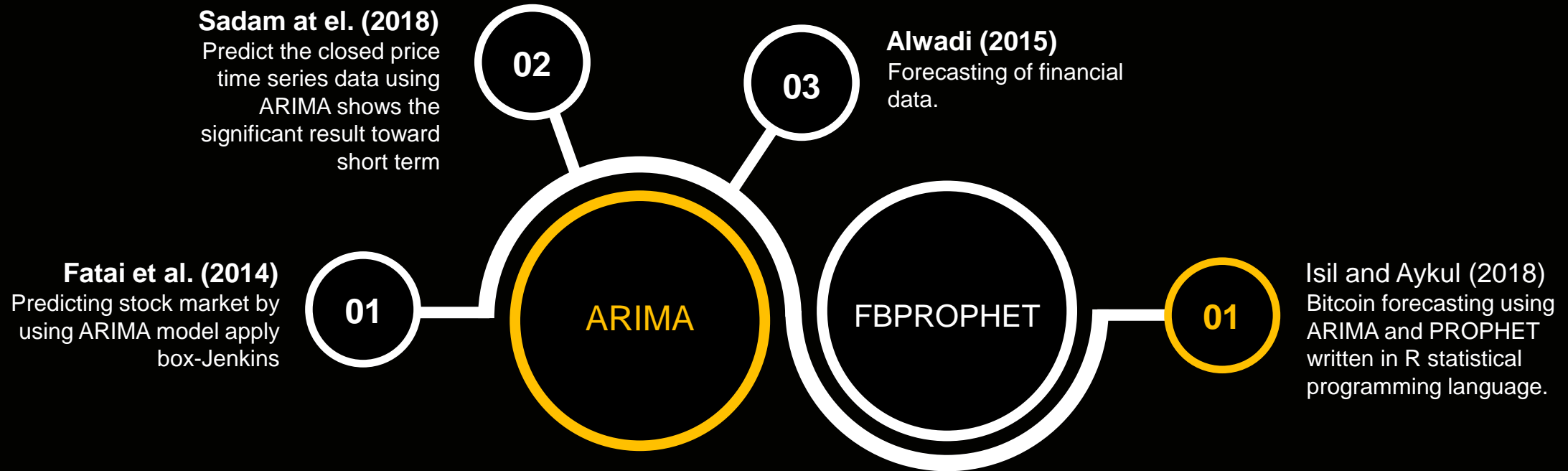
To investigate the trends of ESG stock for Malayan Banking Berhad.

02

Objective 2

To forecast the price of return of ESG stock in the year of 2018 and 2019.

Literature Review



Programming for Daily Return

A stack of gold coins is placed on a newspaper clipping. The coins are of various denominations, including what appear to be 10 Euro and 2 Euro coins. The newspaper text is partially visible and includes words like 'immer mehr', 'denen', 'Gott', 'Retung', and 'Gott'. The background is dark and textured.

```
> maybank.raw.data = read.csv(file.choose(), header=T)
> head(maybank.raw.data)
> maybanktsanual=ts(maybank.raw.data[,9], frequency=365, start=c(2008,1), end=c(2017))
> plot.ts(maybanktsanual)
> maybanktsdaily=ts(maybank.raw.data[,8], frequency=365, start=c(2008,1), end=c(2017))
> plot.ts(maybanktsdaily)
> ds = as.Date(maybank.raw.data$DATE, format="%d/%m/%Y")
> y = maybank.raw.data$DAILY.RETURN
> maybank.data = data.frame(ds,y)
> str(maybank.data)
```

```
> library(prophet)
> m <- prophet(maybank.data)
> future <- make_future_dataframe(m, periods = 365)
> tail(future)
> forecast <- predict(m, future)
> tail(forecast[c('ds', 'yhat', 'yhat_lower', 'yhat_upper')])
> plot(m, forecast)
> prophet_plot_components(m, forecast)
> dyplot.prophet(m, forecast)
```

Programming for Annual Return

```
> ds = as.Date(maybank.raw.data$DATE, format="%d/%m/%Y")
> y = maybank.raw.data$ANNUAL.RETURN
> maybank.data = data.frame(ds,y)
➤ str(maybank.data)
➤ library(prophet)
➤ n <- prophet(maybank.data)
➤ future <- make_future_dataframe(n, periods = 365)
➤ tail(future)
> forecast <- predict(n, future)
➤ tail(forecast[c('ds', 'yhat', 'yhat_lower',
  'yhat_upper')])
➤ plot(n, forecast)
```

Data Analysis and Result



Data analysis

```
> str(maybank.raw.data)
'data.frame': 2455 obs. of 9 variables:
 $ X      : Factor w/ 5 levels "Fr","Mo","Th",...: 1 3 5 4 1 3 5 4 2 1 ...
 $ DATE   : Factor w/ 2455 levels "1/10/2009","1/10/2010",...: 1716 1635 1552 1473
1152 1071 988 827 740 499 ...
 $ OPEN.Px : num 9.56 9.56 9.46 9.49 9.48 9.5 9.46 9.5 9.5 9.45 ...
 $ LAST.Px : num 9.8 9.56 9.55 9.47 9.48 9.48 9.5 9.49 9.5 9.54 ...
 $ HIGH.Px : num 9.8 9.63 9.55 9.5 9.5 9.5 9.52 9.5 9.53 9.68 ...
 $ LOW.Px  : num 9.53 9.51 9.46 9.43 9.46 9.41 9.45 9.44 9.42 9.42 ...
 $ VOLUME  : Factor w/ 2290 levels "1.076M","1.083M",...: 162 1283 272 2130 1714 1313
521 520 1242 392 ...
 $ DAILY.RETURN : Factor w/ 1749 levels "-0.001","-0.001001001",...: 1683 882 1424 28 856
147 884 26 323 1277 ...
 $ ANNUAL.RETURN: Factor w/ 2137 levels "-0.000184632",...: 205 216 295 286 286 266 277
267 228 279 ...
```


Data Analysis and Result



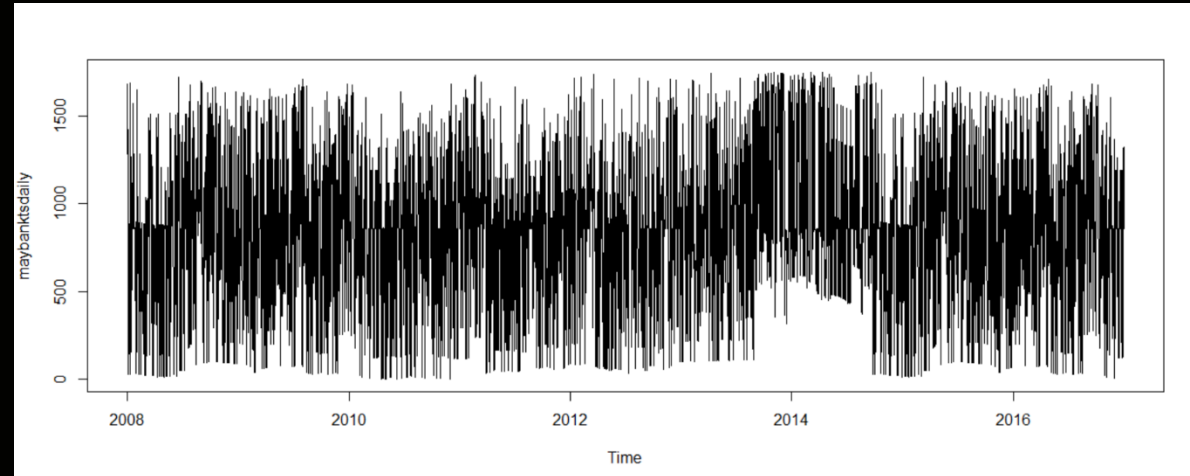
Data analysis

```
> tail(forecast[c('ds', 'yhat', 'yhat_lower', 'yhat_upper')])
```

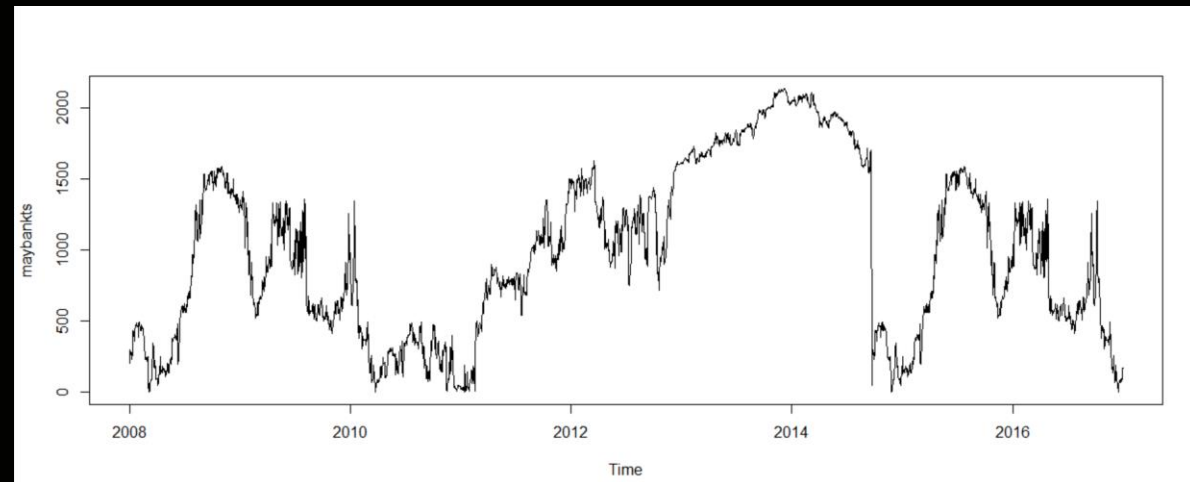
	ds	yhat	yhat_lower	yhat_upper
2815	2018-12-24	864.5504	266.8801	1469.345
2816	2018-12-25	908.6748	300.6243	1493.183
2817	2018-12-26	857.0206	239.8576	1436.082
2818	2018-12-27	883.8006	262.5494	1490.925
2819	2018-12-28	918.5856	338.4124	1529.588
2820	2018-12-29	805.7852	216.0060	1405.567

Data Analysis and Result

Time series analysis for daily return

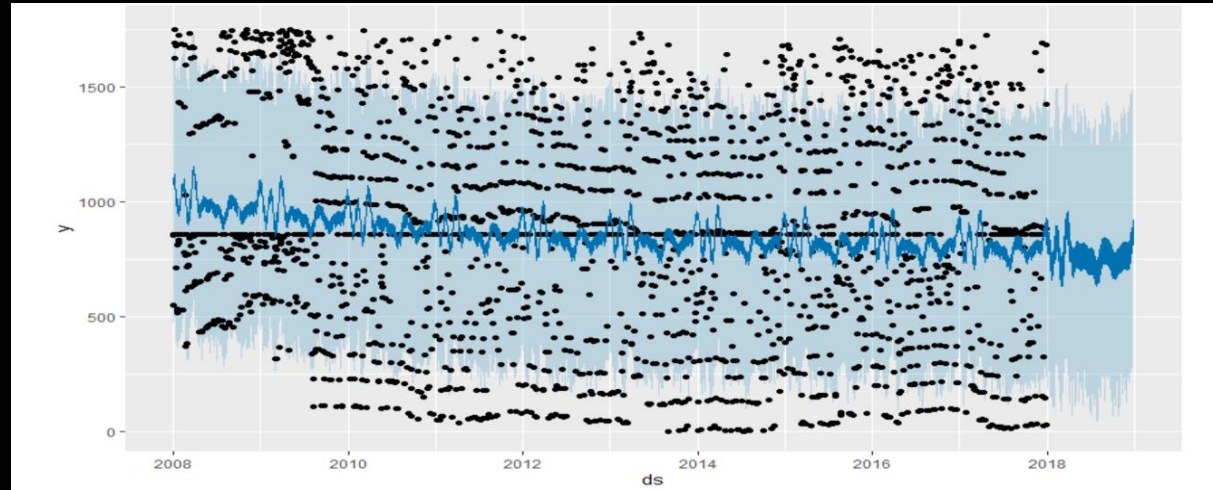


Time series analysis for annual return

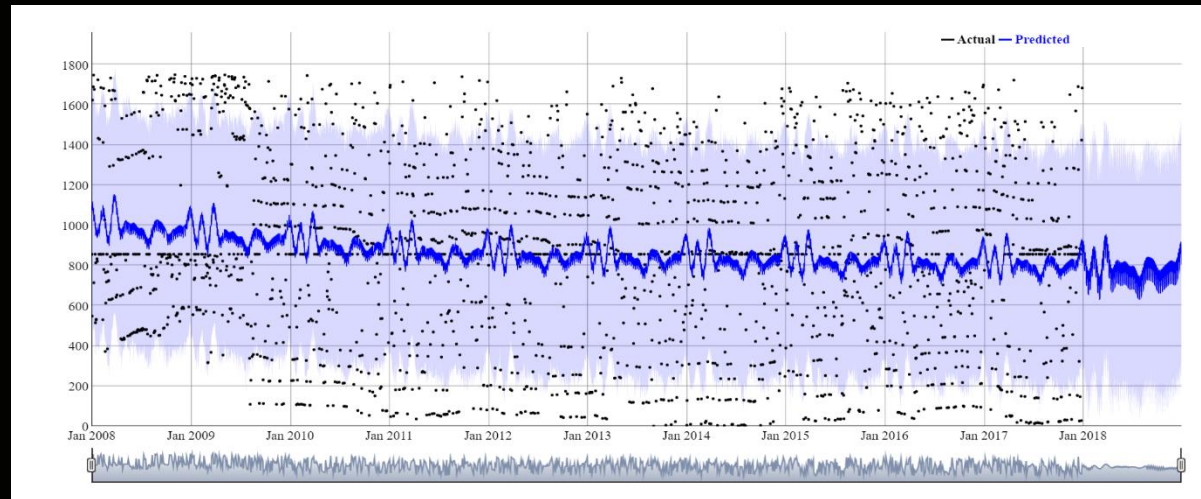


Data Analysis and Result

Forecasting of daily return by using fbprophet
dyplot.prophet

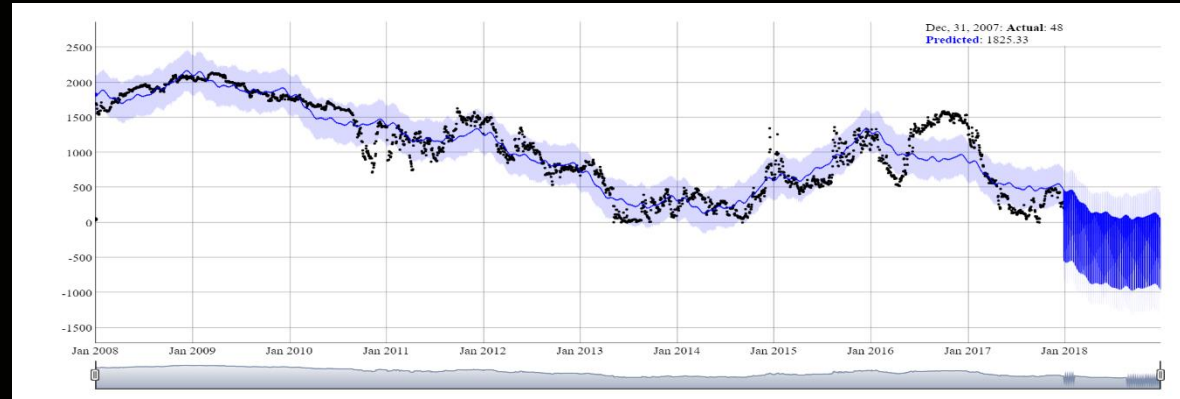


Forecasting of daily return by using normal plot

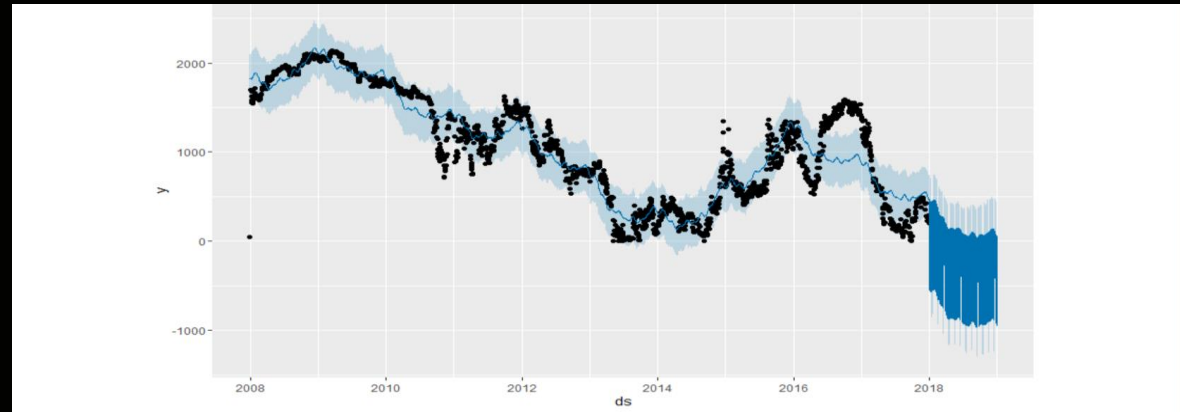


Data Analysis and Result

Forecasting of daily return by using fbprophet
dyplot.prophet



Forecasting of daily return by using normal plot





Thank you