

UKIP_model.R

Aradhya

2022-03-30

```
#Import Libraries
library(xts)

## Loading required package: zoo

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##   as.Date, as.Date.numeric

library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5      v purrr   0.3.4
## v tibble  3.1.6      v dplyr   1.0.7
## v tidyr   1.1.4      v stringr 1.4.0
## v readr   2.1.2      v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::first()  masks xts::first()
## x dplyr::lag()    masks stats::lag()
## x dplyr::last()   masks xts::last()

library(tseries)

## Registered S3 method overwritten by 'quantmod':
##   method      from
##   as.zoo.data.frame zoo

library(dygraphs)
library(forecast)
library(readr)

#Import Data
urlfile="https://raw.githubusercontent.com/raddy123/UKIP/main/uk_inflation_data.csv"
dta = read.csv(urlfile)
dta$dts = as.Date(dta$dts)

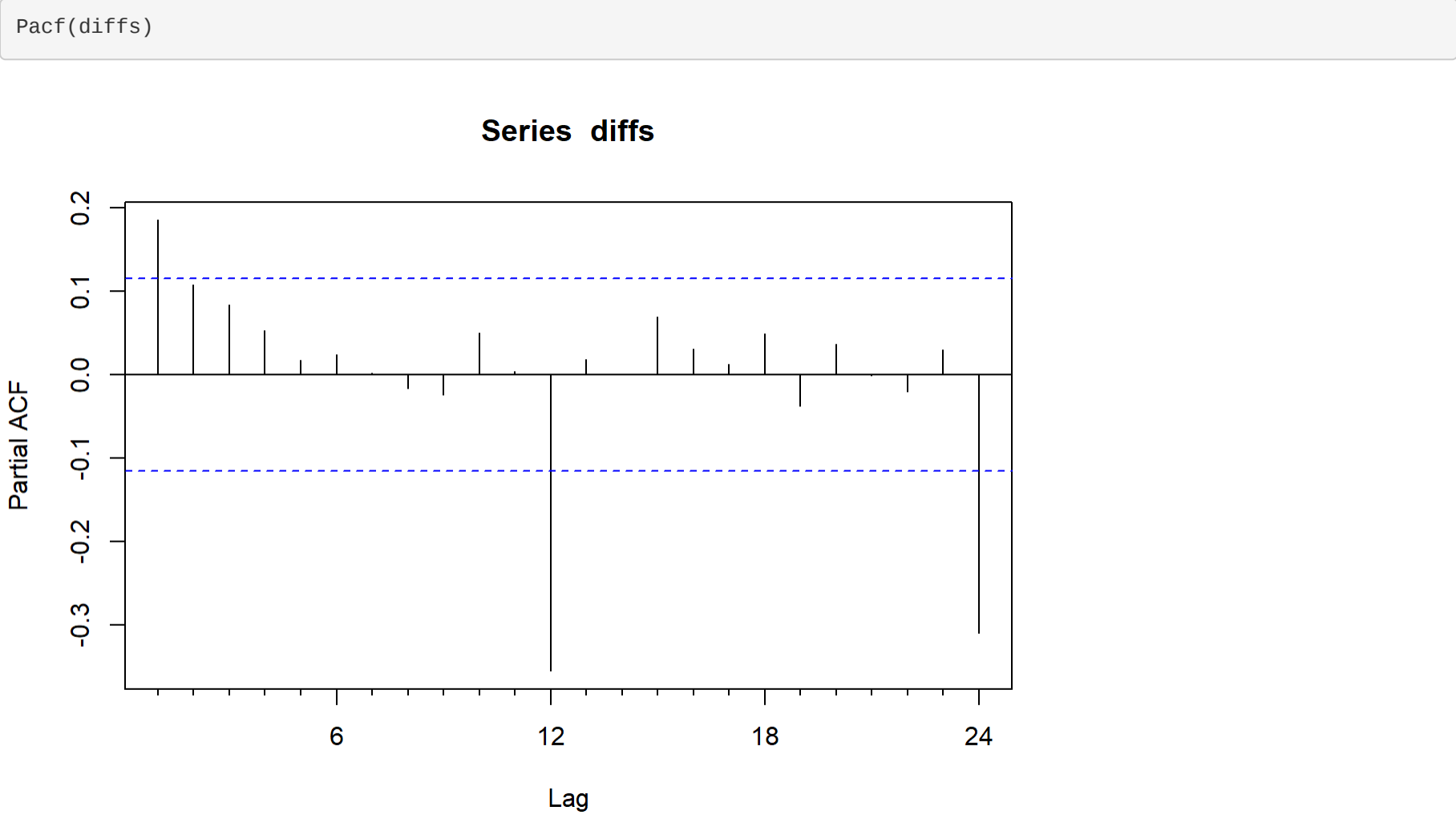
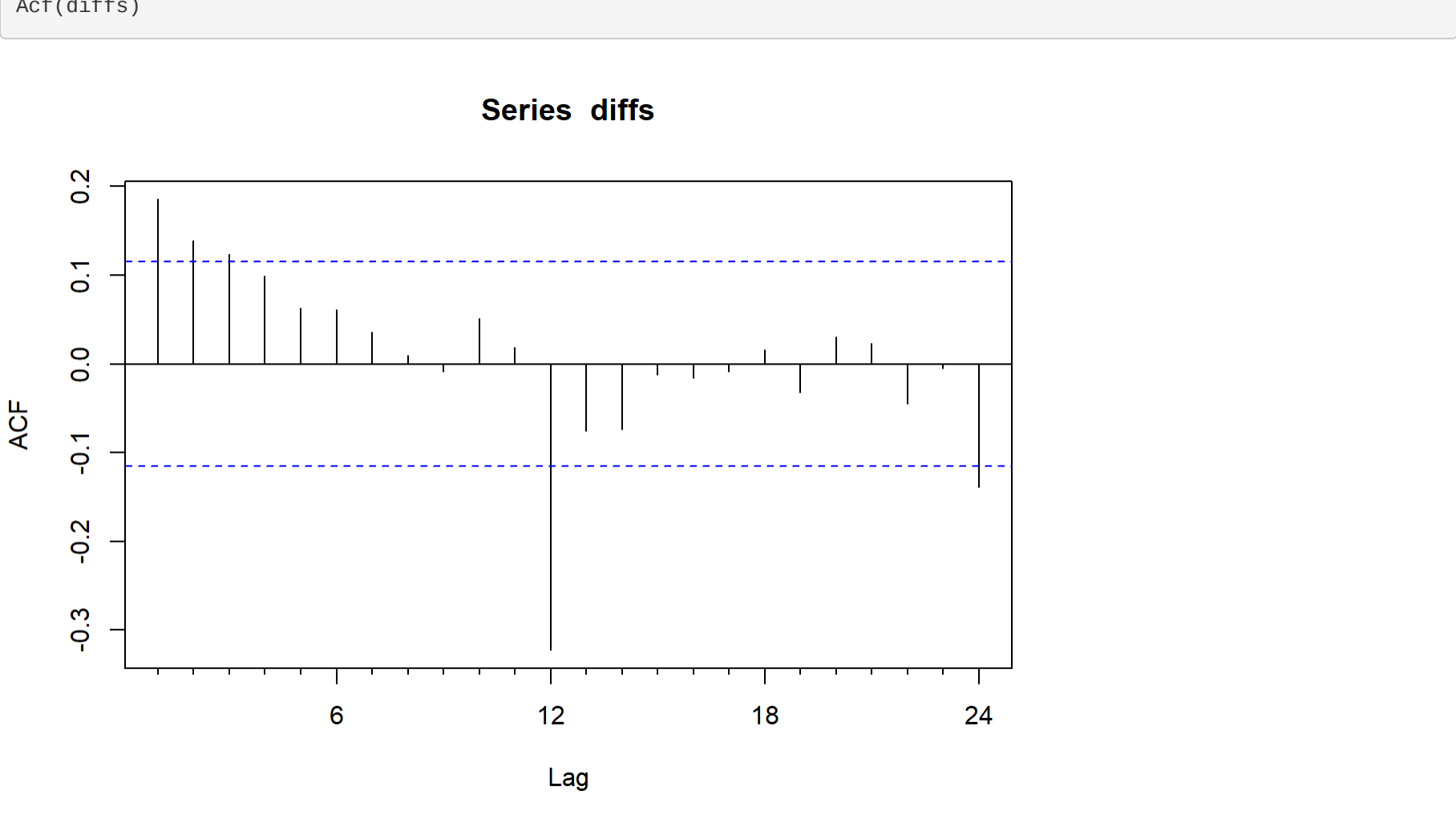
#Clean Data
inflation = ts(dta$y, frequency = 12, start = c(1998,1))

#Check Model Suitability
diffs = diff(inflation)
adf.test(diffs)

## Warning in adf.test(diffs): p-value smaller than printed p-value

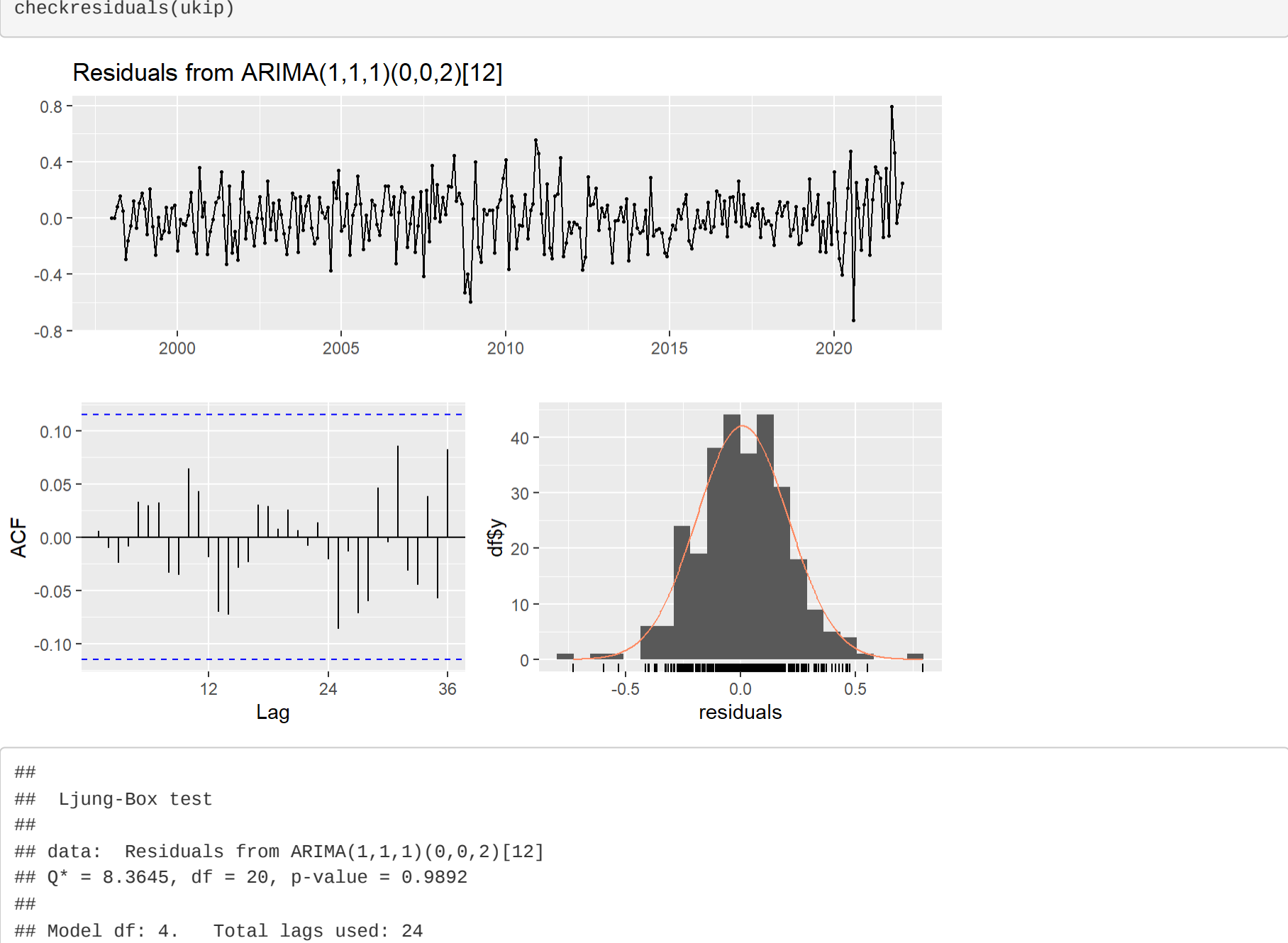
##
## Augmented Dickey-Fuller Test
##
## data:  diffs
## Dickey-Fuller = -4.5434, Lag order = 6, p-value = 0.01
## alternative hypothesis: stationary

Acf(diffs)
```



```
#Form SARIMA Model
ukip = auto.arima(inflation)
summary(ukip)

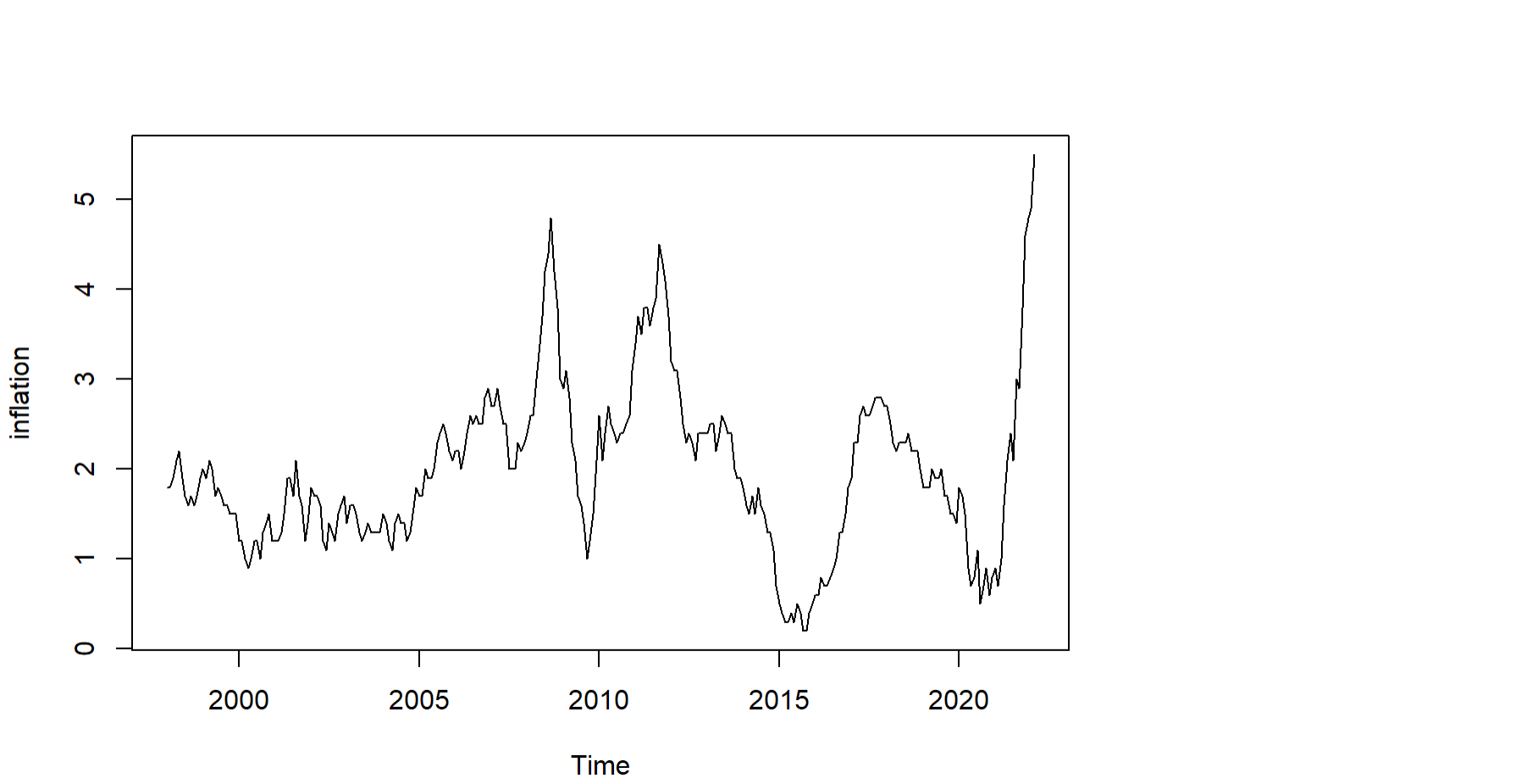
## Series: inflation
## ARIMA(1,1,1)(0,0,2)[12]
##
## Coefficients:
##      ar1      ma1      sma1      sma2
##  0.8668  -0.7227  -0.6119  -0.1521
## s.e.  0.0860   0.1099   0.0665   0.0776
##
## sigma^2 = 0.0405: log likelihood = 50.61
## AIC=-91.21  AICc=-91   BIC=-72.88
##
## Training set error measures:
##              ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.008392956 0.1995035 0.1555199 -1.077572 10.11987 0.1918125
##              ACF1
## Training set 0.005980844
```



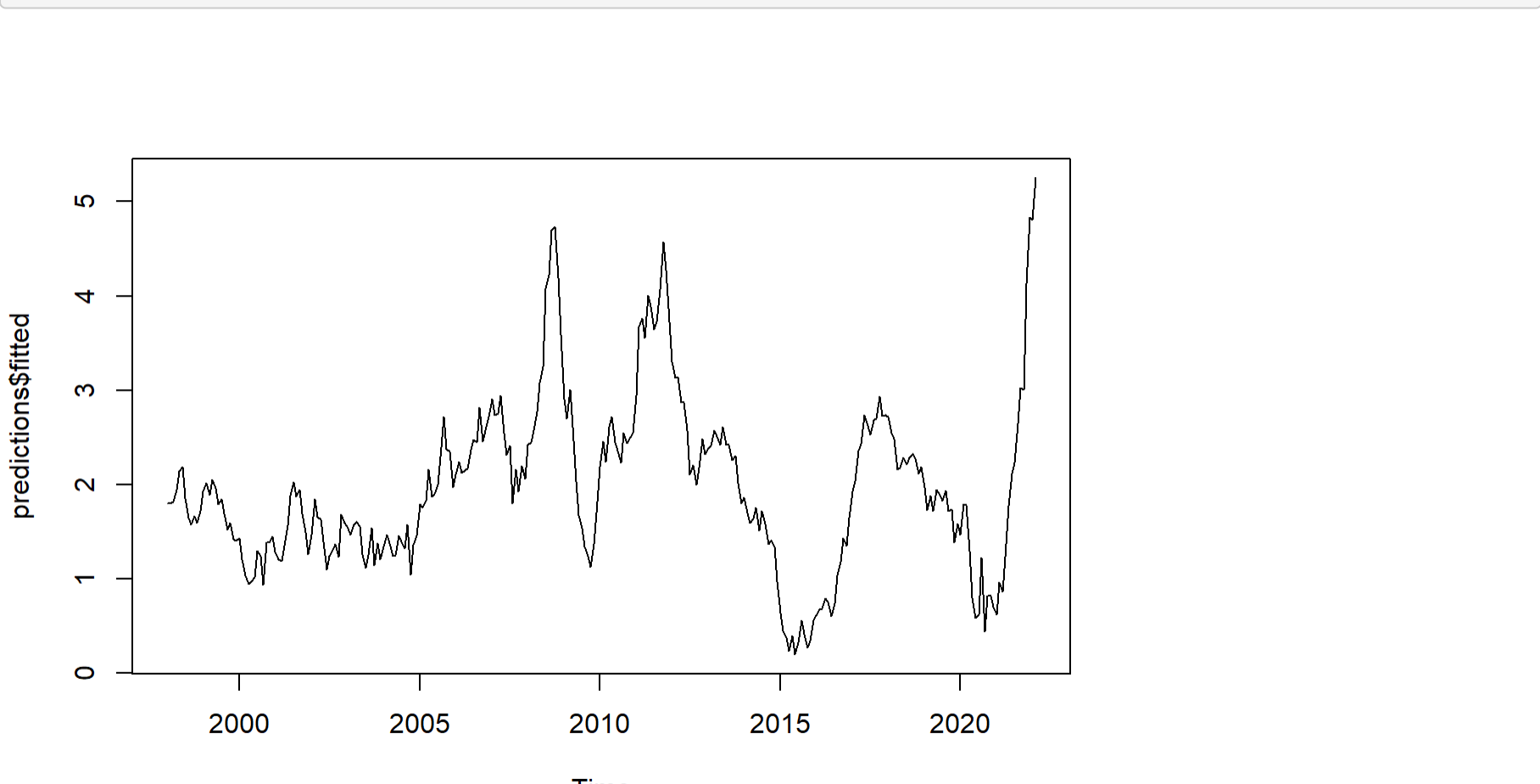
```
##
## Ljung-Box test
##
## data:  Residuals from ARIMA(1,1,1)(0,0,2)[12]
## Q* = 8.3645, df = 20, p-value = 0.9892
##
## Model df: 4. Total lags used: 24
```

```
#Generate Predictions
predictions = forecast(ukip)

#Plot Series
plot.ts(inflation)
```



```
plot.ts(predictions$fitted)
```



```
#Forecast Future Inflation
plot(predictions,
      main = "Forecast of Inflation from UKIP Model \n SARIMA(1,1,1)(0,0,2)[12]",
      xlab = "Year",
      ylab = "Inflation Rate")
grid()
```

