Macroeconomic Forcasting in R

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27/03/2022

This applied study in Time Series follows the **EdX** Macroeconomic forecasting model. The course was originally taught in Eviews. I replicated the codes in R following the insight from Struya Packages used includes among others;

- Forecast
- Tidyverse
- timetk
- lubricate

Data Processing

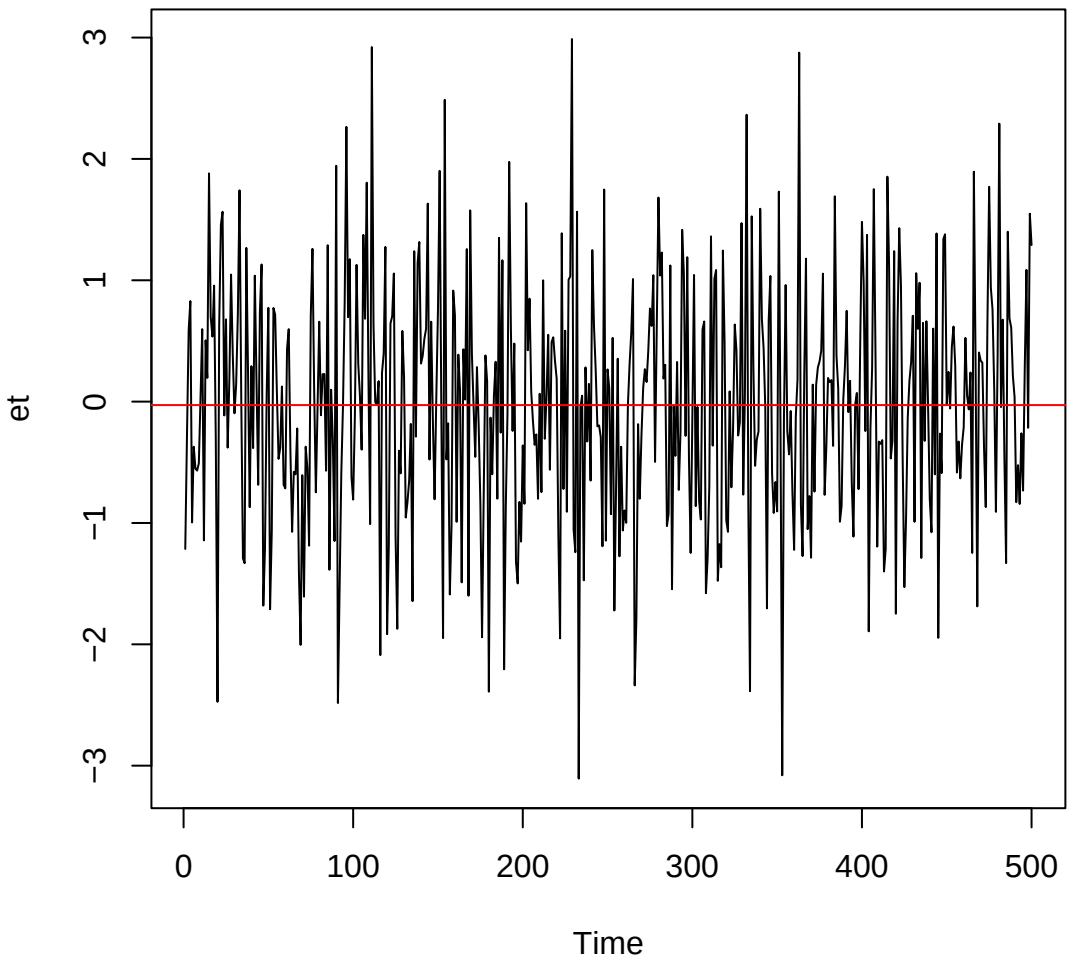
```
library(tidyverse)
library(ggplot2)
library(timetk)
library(dplyr)
library(forecast)
```

```
ARMA_et<-read.csv(file = file.choose(), header = T)
str(ARMA_et)
```

```
'data.frame':   500 obs. of  1 variable:
 $ et: num  -1.214 -0.285 0.59 0.829 -0.995 ...
```

The mean of the data series in 3 decimal places is **-0.028** and the standard deviation is **0.982**. Missing values in the date series is = **0**

```
ARMA_et %>% plot.ts() %>% abline(h=mean(ARMA_et$et), col="red")
```




```
# simulating an AR(1) process: yt  = 3.0 + 0.55*yt-1 + et; y0 = 0

y_AR<-as.vector(1)
y_AR[1]<-0
n=500
for (i in 2:500){
  y_AR[i]<-3 + 0.55*(y_AR[i-1])+ARMA_et$et[i]
}
head(y_AR[5]) # fifth element
```

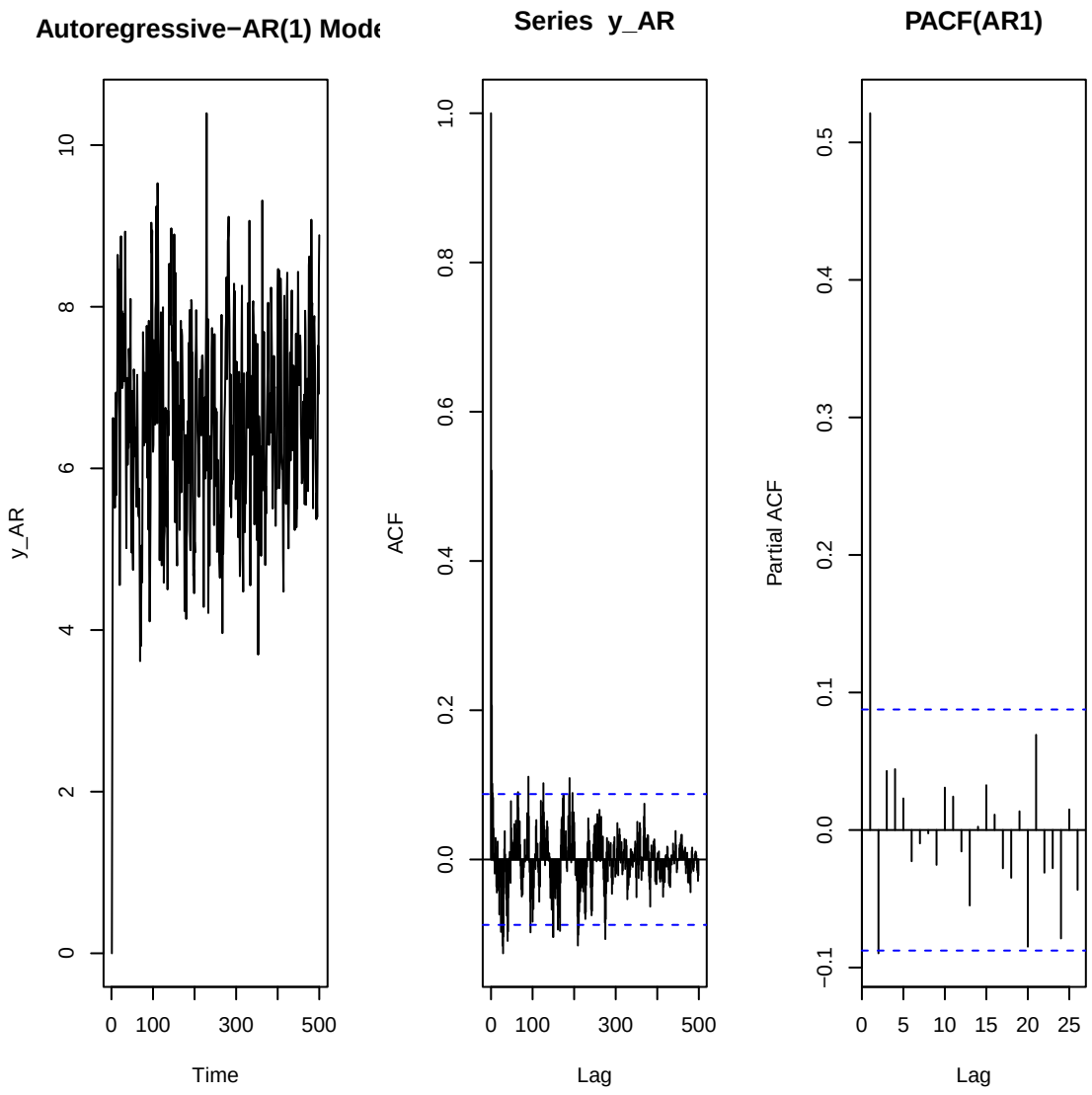
```
[1] 5.647963
```

```
# Generating an MA process  yt = -2.5 + et + 0.70 et-1

y_MA<-as.vector(1)
y_MA[1]<-0
n=500
for (i in 2:500){
```

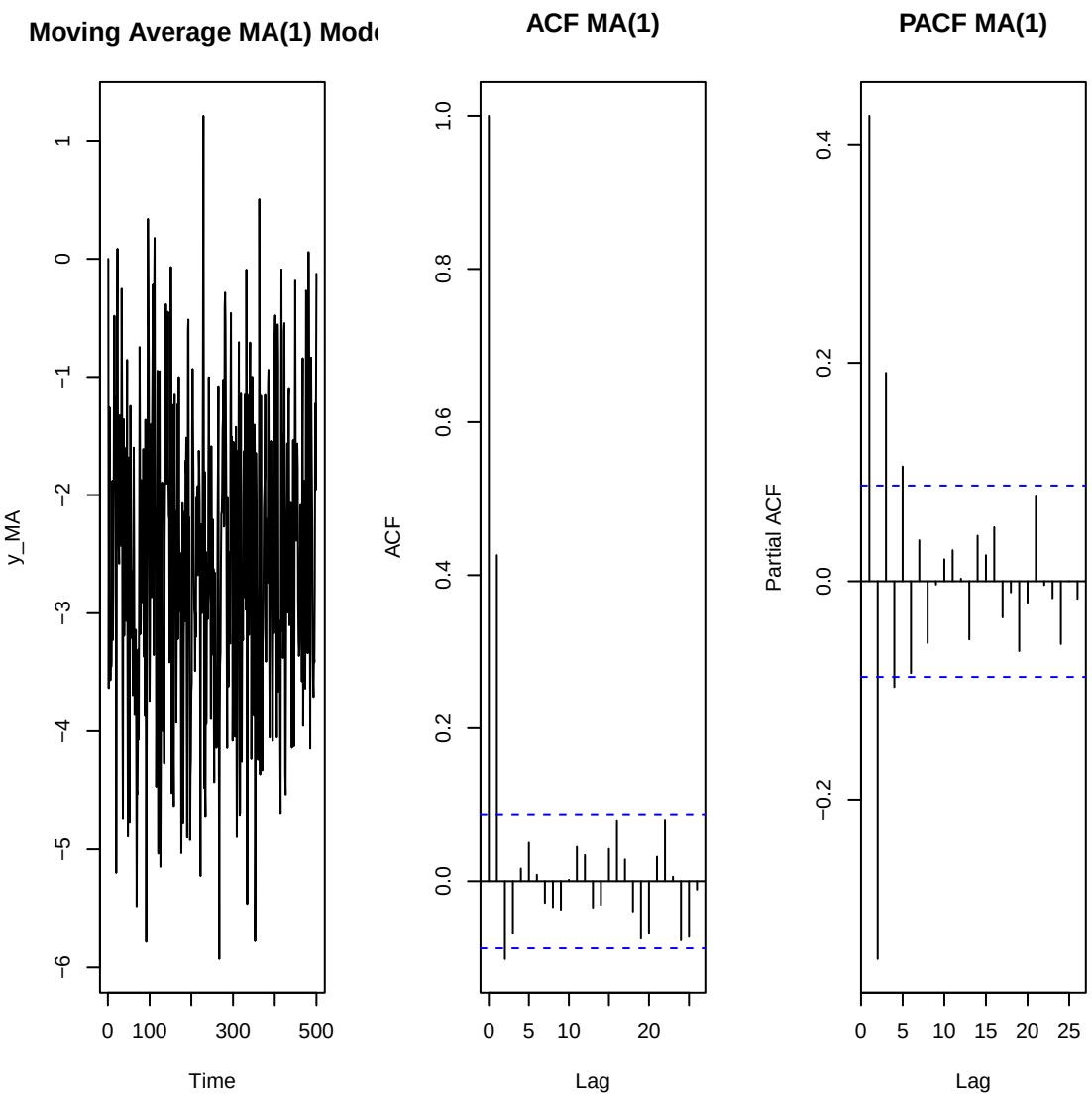
```
  y_MA[i]<--2.5 + ARMA_et$et[i]+0.7*ARMA_et$et[i-1]
}
y_MA[5]
```

```
[1] -2.915444
```

```
# Plot the ACF and PAC for the AR(1) and MA(1) Processes

par(mfrow =c(1, 3))
ts.plot(y_AR, main="Autoregressive-AR(1) Model")
acf(y_AR, "main=ACF(AR1)")
pacf(y_AR, main="PACF(AR1)")
```




```
par(mfrow =c(1, 3))
ts.plot(y_MA, main="Moving Average MA(1) Model")
acf(y_MA, main ="ACF MA(1)")
pacf(y_MA, main="PACF MA(1)")
```


Moving Average MA(1) Mod
y_MA
Time
ACF MA(1)
ACF
Lag
PACF MA(1)
Partial ACF
Lag