Mini-test-1_Jidapa.R

Jidapa

2021-02-11

```
#Mini test 1
#6104640138 Jidapa C.
setwd("C:/R")
#install.packages("quantmod")
#install.packages("fBasics")
#install.packages("sn")
#install.packages("PerformanceAnalytics")
#install.packages("car")
#install.packages("tseries")
#install.packages("forecast")
library(quantmod)
```

```
## Loading required package: xts
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

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

```
## Loading required package: TTR
```

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

```
library(fBasics)
```

```
## Loading required package: timeDate
```

```
## Loading required package: timeSeries
```

```
##
## Attaching package: 'timeSeries'
```

```
## The following object is masked from 'package:zoo':
##
##     time<-
```

```
##
## Attaching package: 'fBasics'
```

```
## The following object is masked from 'package:TTR':
##
##     volatility
```

```
library(sn)
```

```
## Loading required package: stats4
```

```
##
## Attaching package: 'sn'
```

```
## The following object is masked from 'package:fBasics':
##
##     vech
```

```
## The following object is masked from 'package:stats':
##
##     sd
```

```
library(PerformanceAnalytics)
```

```
##
## Attaching package: 'PerformanceAnalytics'
```

```
## The following objects are masked from 'package:timeDate':
##
##     kurtosis, skewness
```

```
## The following object is masked from 'package:graphics':
##
##     legend
```

```
library(car)
```

```
## Loading required package: carData
```

```
##
## Attaching package: 'car'
```

```
## The following object is masked from 'package:fBasics':
##
##     densityPlot
```

```
library(tseries)
library(forecast)
```

```
getSymbols("GOOG",from="2004-08-19",to="2021-01-01")
```

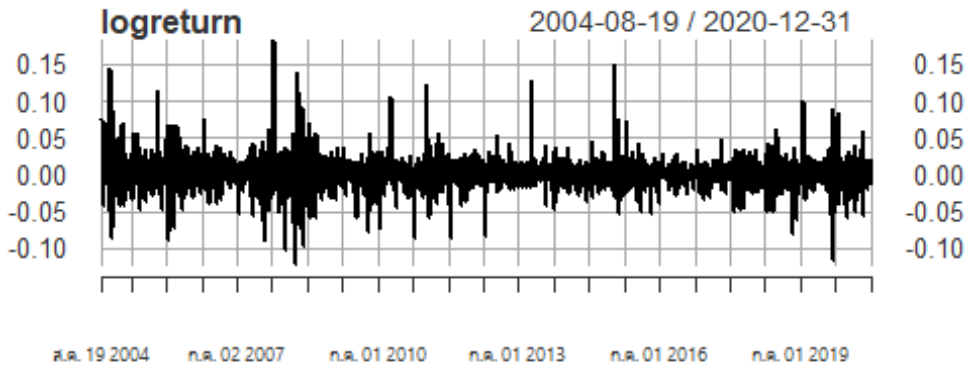
```
## 'getSymbols' currently uses auto.assign=TRUE by default, but will
## use auto.assign=FALSE in 0.5-0. You will still be able to use
## 'loadSymbols' to automatically load data. getOption("getSymbols.env")
## and getOption("getSymbols.auto.assign") will still be checked for
## alternate defaults.
```

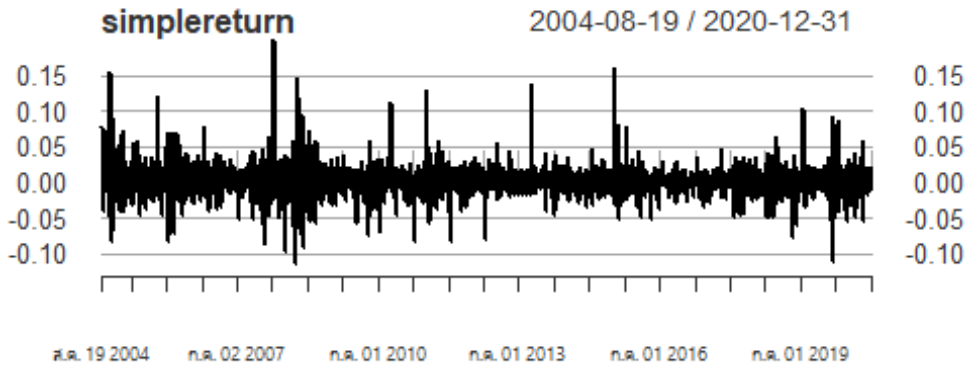
```
##
## This message is shown once per session and may be disabled by setting
## options("getSymbols.warning4.0"=FALSE). See ?getSymbols for details.

## [1] "GOOG"

price = GOOG[,6]
logprice = log(price)
logreturn = diff(logprice)
simplereturn <- exp(logreturn)-1

#a) plot log return and simple return
par(mfrow=c(2,1))
plot(logreturn, type='l')
plot(simplereturn, type='l')
```






```
#b)
table.Stats(logreturn)

##                   GOOG.Adjusted
## Observations         4121.0000
## NAs                     1.0000
## Minimum                -0.1234
## Quartile 1             -0.0074
## Median                  0.0007
## Arithmetic Mean         0.0009
## Geometric Mean          0.0007
```

```
## Quartile 3             0.0100
## Maximum                0.1823
## SE Mean                0.0003
## LCL Mean (0.95)        0.0003
## UCL Mean (0.95)        0.0014
## Variance               0.0004
## Stdev                  0.0191
## Skewness               0.4528
## Kurtosis               9.1391
```

```
#c)
newlogreturn = logreturn[2:nrow(logreturn)]
newsimplereturn = simplereturn[2:nrow(simplereturn)]
jarque.bera.test(newlogreturn)
```

```
##
##  Jarque Bera Test
##
## data:  newlogreturn
## X-squared = 14482, df = 2, p-value < 2.2e-16
```

```
#We reject the null hypothesis
## The log return does not have normal distribution according to JB test.
```

```
#d) Test mean =0.08
tstat = (mean(newlogreturn)-0.08)/var(newlogreturn)
pv_mean = pnorm(tstat)
```

```
#e) 95 percent CI of daily log return
t.test(newlogreturn)
```

```
## Warning in tstat + c(-cint, cint): Recycling array of length 1 in array-
vector arithmetic is deprecated.
##   Use c() or as.vector() instead.
```

```
## Warning in cint * stderr: Recycling array of length 1 in vector-array
arithmetic is deprecated.
##   Use c() or as.vector() instead.
```

```
##
##  One Sample t-test
##
## data:  newlogreturn
## t = 2.8957, df = 4120, p-value = 0.003803
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  0.0002787253 0.0014474425
## sample estimates:
```

```
##    mean of x
## 0.0008630839

# 95% CI is between 0.0002787253 and 0.0014474425

#f)
T=length(newlogreturn)
m3 = skewness(newlogreturn)
tst = m3/sqrt(6/T)
tst

## [1] 11.8664

pv=1-pnorm(tst)
pv

## [1] 0

# We reject the null.
#the skewness of the log return is more than zero since the p-value falls in
rejection region

#g)
K=kurtosis(newlogreturn)
K

## [1] 9.139095

tst_K = K/sqrt(24/T)
tst_K

## [1] 119.7564

# We reject the null.
# the excess kurtosis of the logreturn is not equal to zero since the
calculated K* is higher than 1.96.
```