

Mini-test 1

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setwd("/Users/Orachai/Documents/BE/4TH YEAR 2ND SEMESTER/EE435")
cat(rep("\n",50))
library(quantmod)
library(fBasics)
library(sn)
library(PerformanceAnalytics)
library(car)
library(tseries)
library(forecast)
getSymbols("GOOG",from="2004-08-19",to="2021-01-01")
da=GOOG

chartSeries(GOOG,theme="white")

price=da[,6]
logprice=log(price)
plot(logprice,type='l')
logreturn=diff(log(price))
simplereturn <-exp(logreturn)-1

par("mar")
par(mar=c(1,1,1,1))
par(mfrow=c(2,1))
plot(logreturn,type='l')
plot(simplereturn)
newlogreturn <- logreturn[2:nrow(logreturn),]
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newsimplereturn <- simplereturn[2:nrow(logreturn),]
table.Stats(logreturn)
par(mfrow=c(1,1))
hist(logreturn, breaks=100, col="slateblue")
# use qqnorm function
par(mfrow=c(1,1))
qqnorm(newlogreturn) #test whether the return has nd. or not
qqline(newlogreturn, col = 2)
jarque.bera.test(newlogreturn)

#4 Test mean = 0.08
t.test(newlogreturn)
#the HO: the mean of the log return = 0: R(r_t)=0.08
#H1: The mean of the log return is not = 0.08

#5 Test Skewness = 0
T=length(newlogreturn) #create the length of the new log return

s3=skewness(newlogreturn)
tst = s3/sqrt(6/T)
tst

pv = 2*(1-pnorm(tst)) #if the tst is positive, use this command instead
pv

#6 Test excess kurtosis =0
k4 = kurtosis(newlogreturn)

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tst = k4/sqrt(24/T)

tst

pv = 2*(1-pnorm(tst))

pv

Answer:

b. mean = 0.009, S.E.= 0.0003, Skewness = 0.4528, Excess kurtosis= 9.1391, Minimum = 0.01, Maximum =0.1823

c. Performed Jarque Bera test

data: newlogreturn

X-squared = 14482, df = 2, p-value <

2.2e-16

H0: The daily log return is distributed as normal distribution

Ha:

Since the p-value is almost close to 0. We can reject the null hypothesis, such that the daily log return is not distributed as normal distribution at 95% confidence interval.

d. H0: the mean of the log return = 0.08

Ha: the mean of the log return \neq 0.08

e. 0.0002787253 0.0014474425

f.

g. H0: K=3

and Ha = K \neq 3

> tst

[1] 119.7564

> pv = 2*(1-pnorm(tst))

> pv

[1] 0

So we can conclude that we can reject the null hypothesis, such that the excess kurtosis is not equal to 3.