Homework 4 Q3

YueLi

15620161152260

Q3

```
rm(list = ls(all = TRUE))
graphics.off()

# install and load packages
libraries = c("FinTS", "tseries")
lapply(libraries, function(x) if (!(x %in% installed.packages())) {
  install.packages(x)
})
lapply(libraries, library, quietly = TRUE, character.only = TRUE)


# plot of crix return
ret = diff(log(crx$Pr))
Dare = factor(date1[-1])
retts = data.frame(Dare, ret)
```

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- # comparison of different crix returns
- par(mfrow = c(2, 2))
- plot(crxDa, crxPr, type = "o")
- lines(crx$Pr)
- plot(crx$Da, log(crx$Pr), type = "o")
- lines(log(crx$Pr))
- plot(retts$Dare, diff(crx$Pr), type = "o")
- lines(diff(crx$Pr))
- plot(retts$Dare, retts$ret, type = "o")
- lines(retts$ret)

- # ARIMAfit <- auto.arima(ret, approximation=FALSE,trace=FALSE)
- # summary(ARIMAfit)

- # arima202 predict
- fit202 = arima(ret, order = c(2, 0, 2))

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```
# vola cluster
par(mfrow = c(1, 1))
res = fit202$residuals
res2 = fit202$residuals^2
tsres202 = data.frame(Dare, res2)
plot(tsres202$Dare, tsres202$res2, type = "o", ylab = NA)
lines(tsres202$res2)

par(mfrow = c(1, 2))
# plot(res2, ylab='Squared residuals', main=NA)
acfres2 = acf(res2, main = NA, lag.max = 20, ylab = "Sample Autocorrelation",
              lwd = 2)
pacfres2 = pacf(res2, lag.max = 20, ylab = "Sample Partial Autocorrelation",
                lwd = 2, main = NA)

# arch effect
res = fit202$residuals
ArchTest(res)  #library FinTS
Box.test(res2, type = "Ljung-Box")
```