HW4-1-2-3

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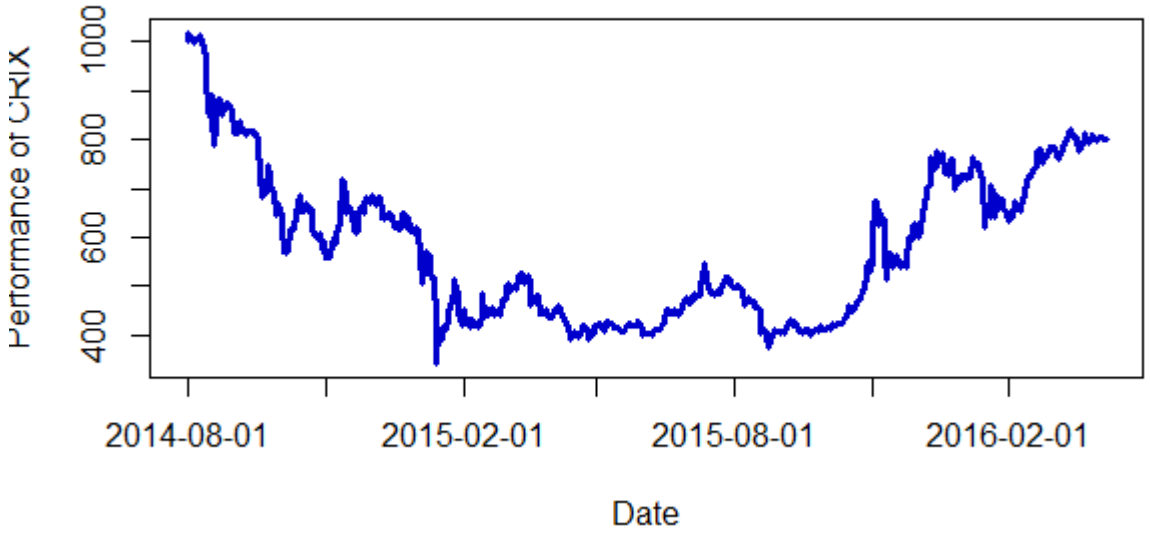
Fig3、4、5、6

Fig3-Performance of CRIX

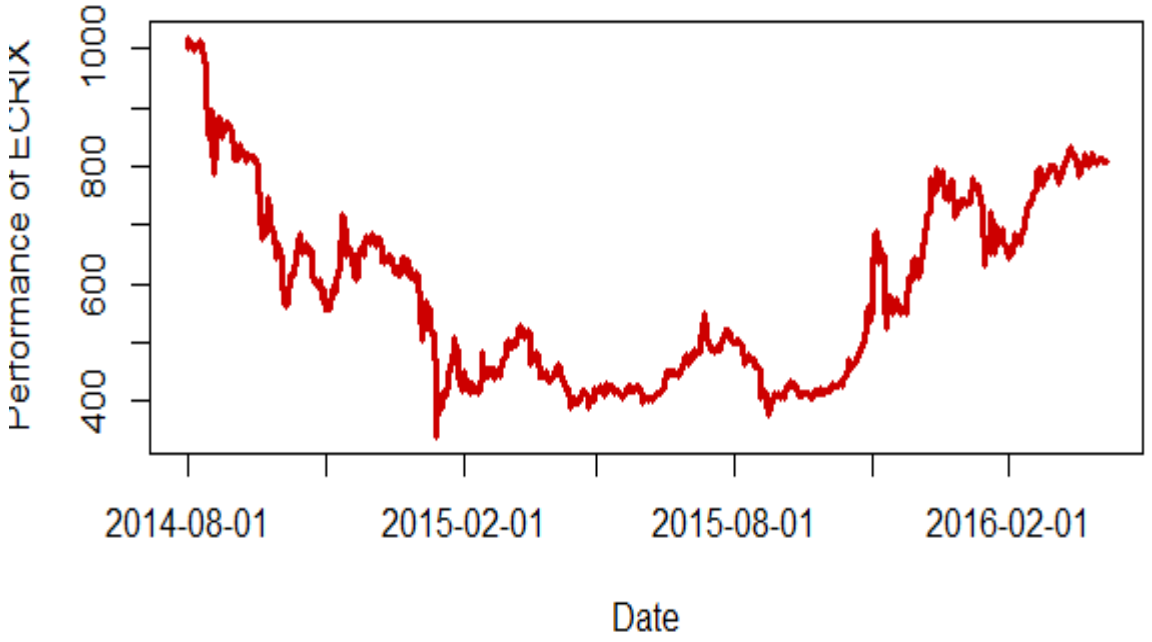


CRIX

```
rm(list = ls(all = TRUE))
graphics.off()
##
load("crix.RData")

plot(crix, type = "l", col = "blue3",
xaxt = "n", lwd = 3, xlab = "Date",
     ylab = "Performance of CRIX")
axis(1, at =
c(2,94,186,275,367,459,551), label
=
names(crix)[c(2,94,186,275,367,45
9,551)])
```

Fig3-Performance of ECRIX



ECRIX

```
rm(list = ls(all = TRUE))
graphics.off()
##
load("ecrix.RData")

plot(ecrix, type = "l", col = "red3",
xaxt = "n", lwd = 3, xlab = "Date",
          ylab = "Performance of
ECRIX")
axis(1, at =
c(2,94,186,275,367,459,551), label
=
names(ecrix)[c(2,94,186,275,367,4
59,551)])
```

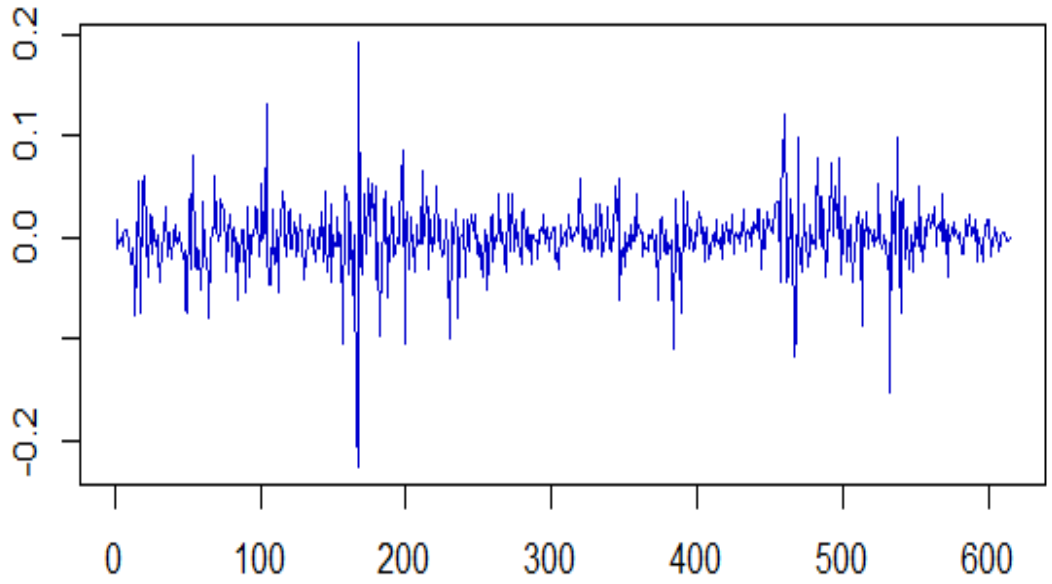
Fig3-Performance of EFCRIX

EFCRIX

```
rm(list = ls(all = TRUE))
graphics.off()
##
load("efcrix.RData")

plot(efcrix, type = "l", col =
"yellow3", xaxt = "n", lwd = 3, xlab
= "Date",
     ylab = "Performance of
EFCRIX")
axis(1, at =
c(2,94,186,275,367,459,551), label
=
names(efcrix)[c(2,94,186,275,367,4
59,551)])
```

Fig4-Log return of CRIX Index




```
rm(list = ls(all = TRUE))
graphics.off()
libraries = c("zoo", "tseries", "xts")
lapply(libraries, function(x) if (!(x %in%
installed.packages())) {
  install.packages(x)
})
lapply(libraries, library, quietly = TRUE,
character.only = TRUE)
load(file = "crix.RData")
ret   = diff(log(crix))
plot(ret,type = "l", col = "blue3", ylab =
NA, xlab = NA)

mean(ret)
var(ret)
sd(ret)
```

Fig5-histogram of returns&qq plot

```
load(file = "crix.RData")
ret   = diff(log(crix))
# histogram of price
hist(crix, col = "grey", breaks = 40, freq = FALSE)
lines(density(crix), lwd = 2)
par(mfrow = c(1, 2))
# histogram of returns
hist(ret, col = "grey", breaks = 20, freq = FALSE, ylim = c(0, 25),
xlab = NA)
lines(density(ret), lwd = 2)
mu = mean(ret)
sigma = sd(ret)
x = seq(-4, 4, length = 100)
curve(dnorm(x, mean = mean(ret), sd = sd(ret)), add = TRUE, col =
"darkblue",
      lwd = 2)
# qq-plot
qqnorm(ret)
qqline(ret, col = "blue", lwd = 3)
```

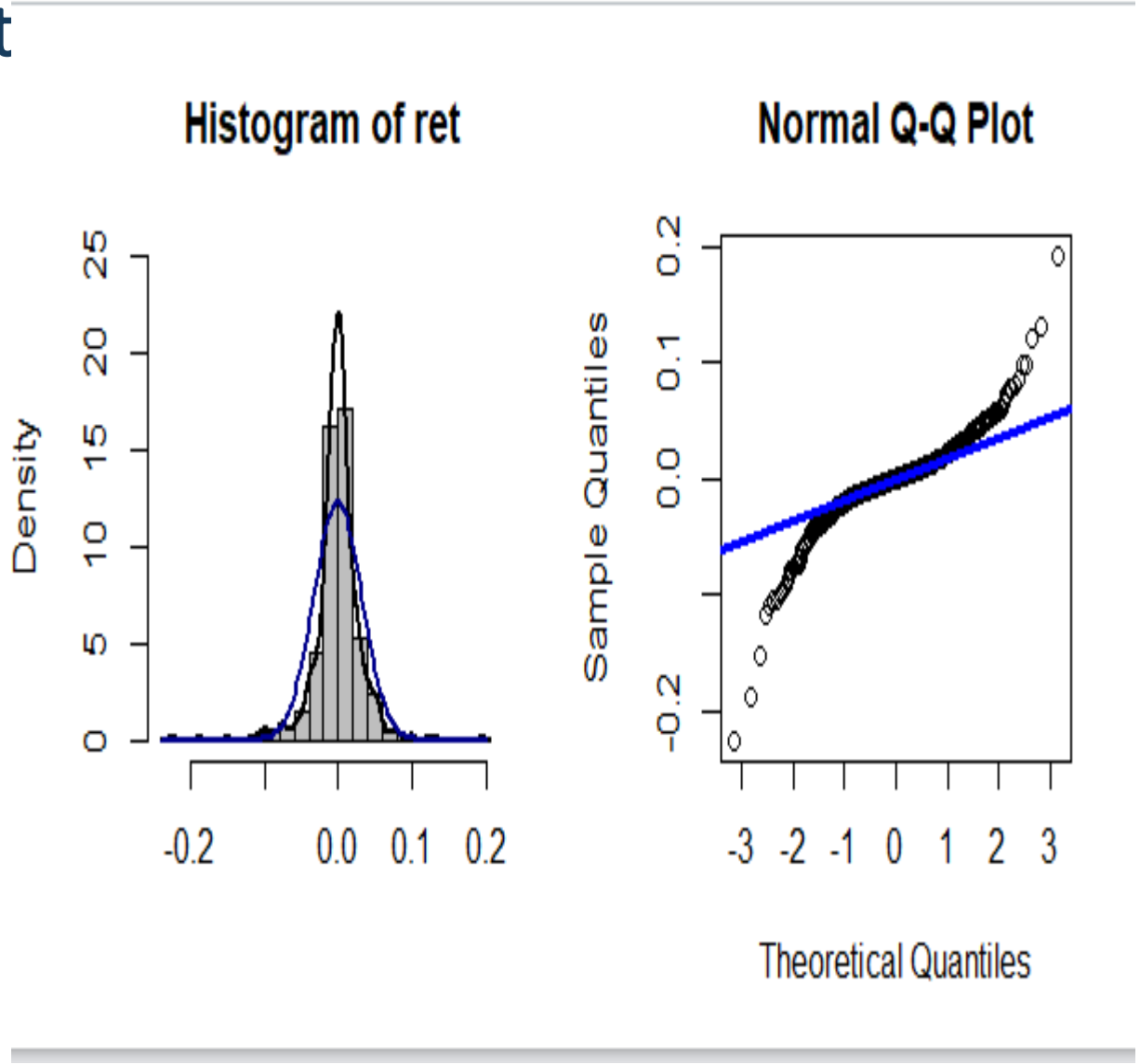


Fig6-sample of ACF and PACF of CRIX returns

```
rm(list = ls(all = TRUE))
graphics.off()
load(file = "crix.RData")
ret = diff(log(crix))
# acf plot
autocorr = acf(ret, lag.max = 20, ylab = "Sample Autocorrelation",
main = NA,
            lwd = 2, ylim = c(-0.3, 1))
# plot of pacf
autopcorr = pacf(ret, lag.max = 20, ylab = "Sample Partial
Autocorrelation",
              main = NA, ylim = c(-0.3, 0.3), lwd = 2)
print(cbind(autopcorr$lag, autopcorr$acf))
```

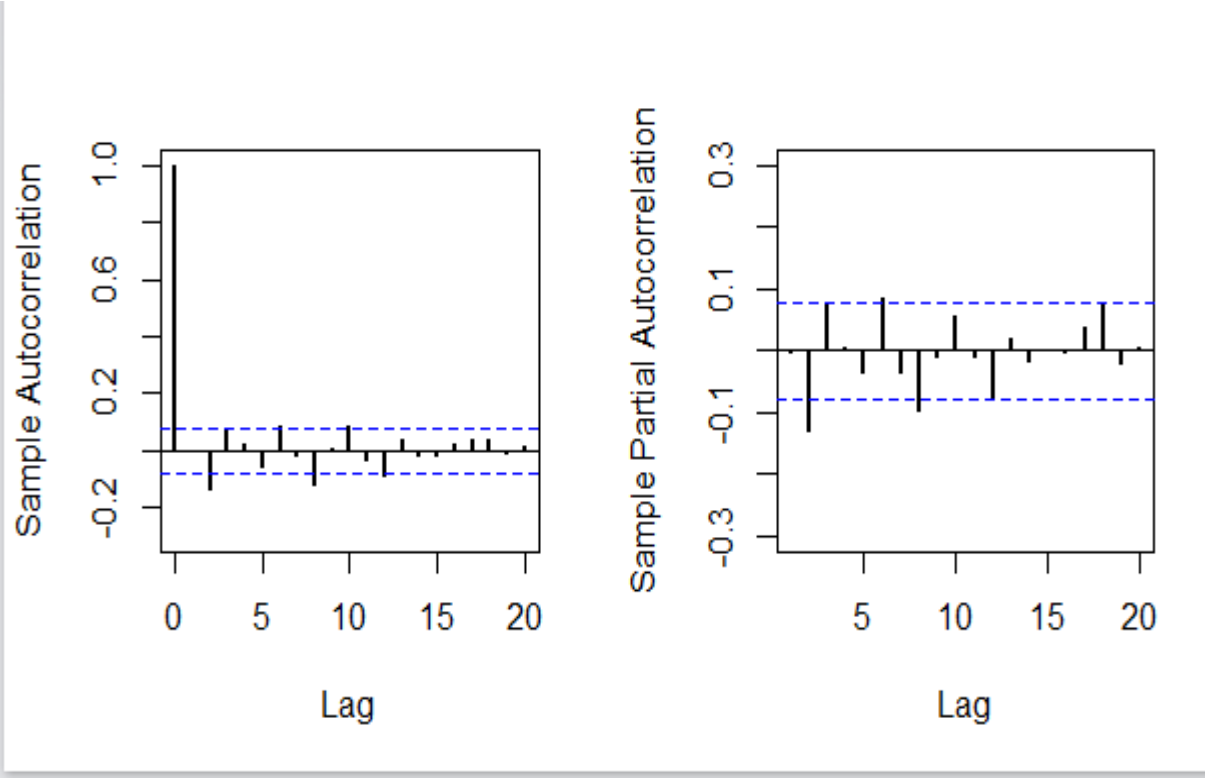
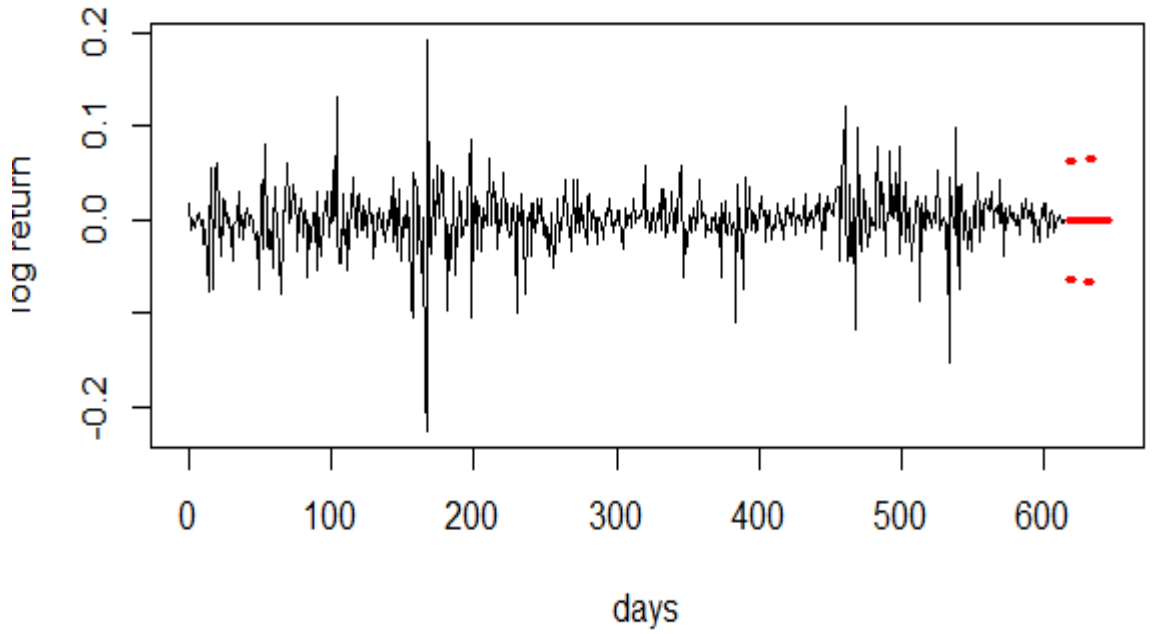


Fig7

Fig7- CRIX returns and predicted value




```
rm(list = ls(all = TRUE))
graphics.off()
load(file = "crix.RData")
ret = diff(log(crix))
fit202 = arima(ret, order = c(2, 0, 2))
crpre = predict(fit202, n.ahead = 30)

dates = seq(as.Date("02/08/2014",
format = "%d/%m/%Y"), by = "days",
length = length(ret))

plot(ret, type = "l", xlim = c(0, 644), ylab
= "log return", xlab = "days",
    lwd = 1.5)
lines(crpre$pred, col = "red", lwd = 3)
lines(crpre$pred + 2 * crpre$se, col =
"red", lty = 3, lwd = 3)
lines(crpre$pred - 2 * crpre$se, col =
"red", lty = 3, lwd = 3)
```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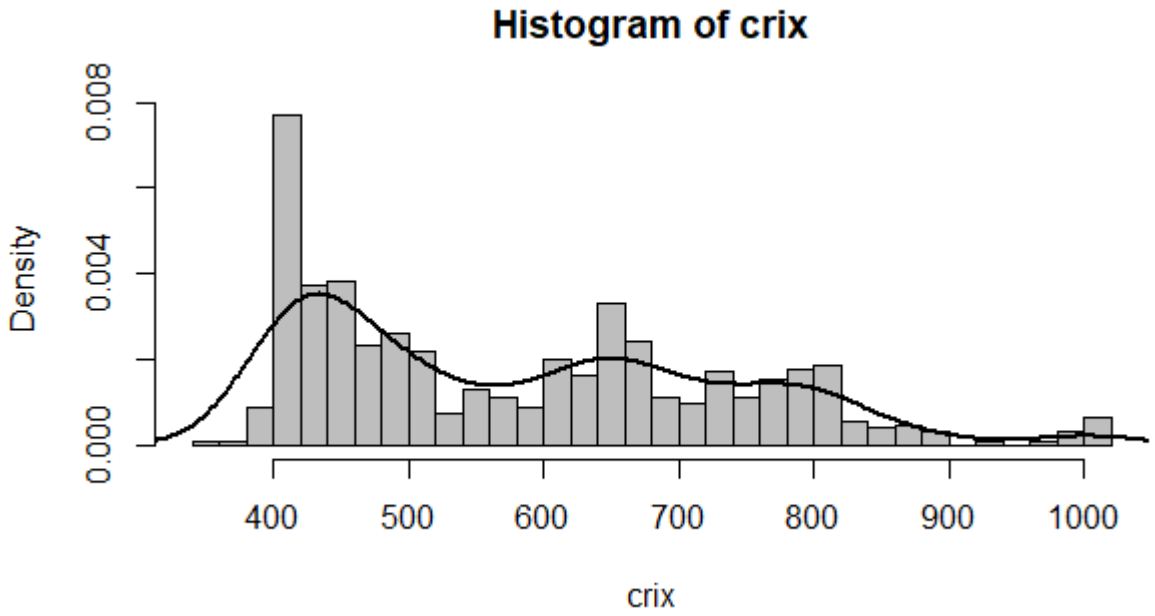
Histogram of price




```
rm(list = ls(all = TRUE))
graphics.off()
load(file = "crix.RData")
hist(crix, col = "grey", breaks = 40, freq = FALSE)
lines(density(crix), lwd = 2)

par(mfrow = c(1, 2))
```


THANKS