FIN 740 [redacted]

PROJECT

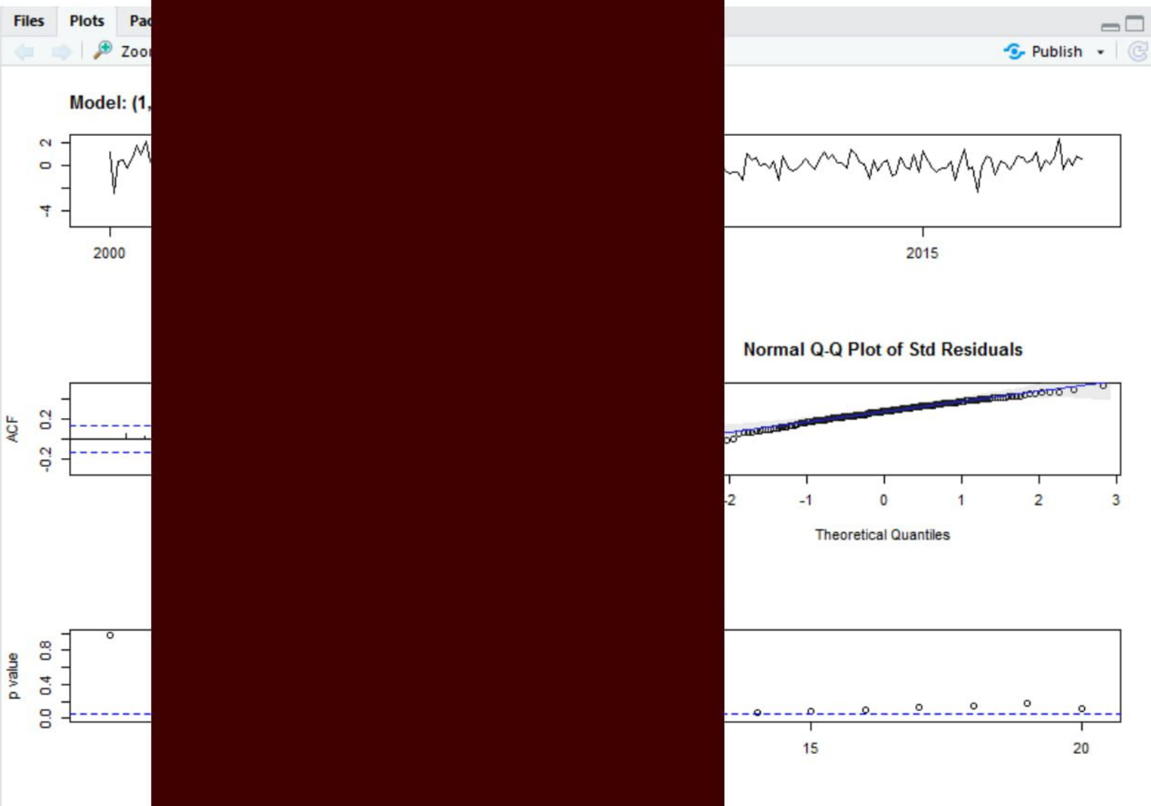
[redacted]

Blue shows final answers

In this project, I am going to research [redacted]e symbol of the stock is [redacted]

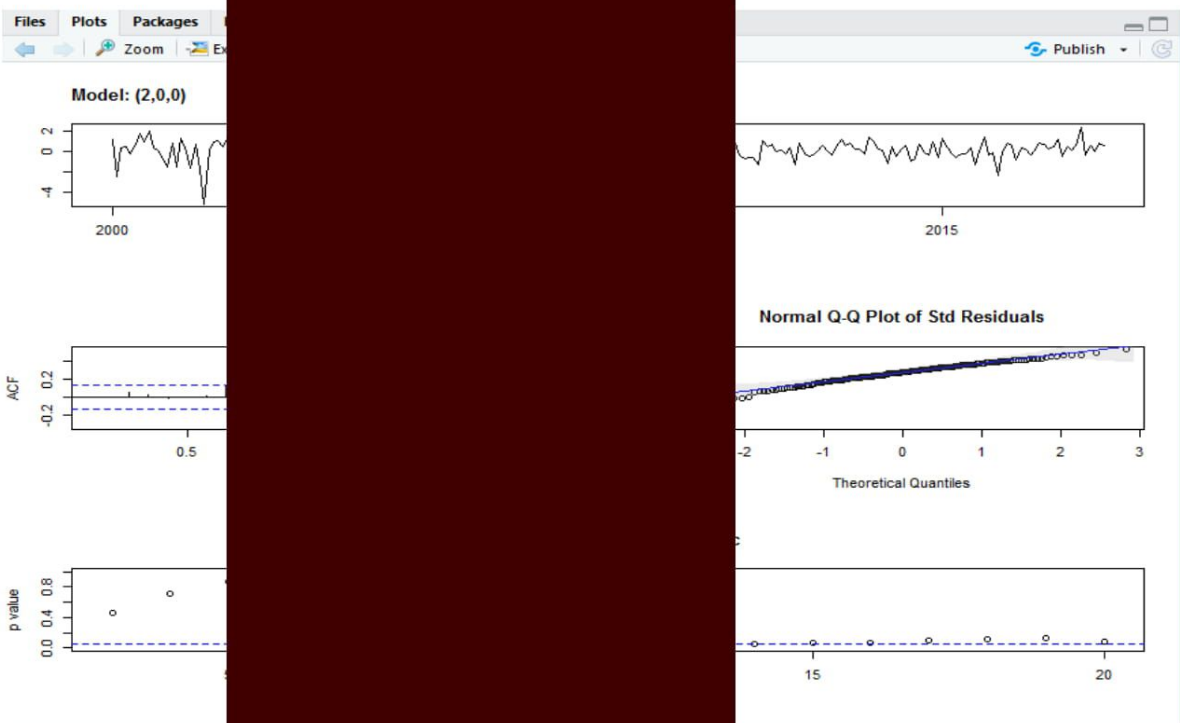
```
> #Install package 'quantmod' and load it.
> install.packages("quantmod")
Installing package into '\\ntdata/Personal/HTrinh/R/win-library/3.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.5/quantmod_0.4-14.zip'
Content type 'application/zip' length 960802 bytes (938 KB)
downloaded 938 KB

package 'quantmod' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\htrinh\AppData\Local\Temp\RtmpCqTW3i\downloaded_packages
> 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
Version 0.4-0 included new data defaults. See ?getSymbols.
Learn from a quantmod author: https://www.datacamp.com/courses/importing-and-managing-fin
ancial-data-in-r
> #Download daily prices of stock [redacted]
> getSymbols("[redacted]src="yahoo", from=[redacted]
'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] "[redacted]
> #Obtain monthly log stock returns
>[redacted]n <- monthlyReturn([redacted]ubset=NULL, type='log', leading=TRUE)
> #Change the data type to ts
> rtn <- ts([redacted], frequ[redacted])
> # Install and import astsa package
> install.packages("astsa")
Installing package into '\\ntdata/Personal/HTrinh/R/win-library/3.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.5/astsa_1.8.zip'
Content type 'application/zip' length 770254 bytes (752 KB)
downloaded 752 KB

package 'astsa' successfully unpacked and MD5 sums checked
```

```
The downloaded binary packages are in
        C:\Users\[redacted]AppData\Local\Temp\RtmpCqTW3i\downloaded_packages
> library(astsa)

> # Fit an A[redacted]
> BA_fit <- [redacted]
initial  val[redacted]
iter   2 val[redacted]
iter   3 val[redacted]
iter   4 val[redacted]
iter   4 val[redacted]
iter   4 val[redacted]
final  value[redacted]
converged[redacted]
initial  val[redacted]
iter   2 val[redacted]
iter   3 val[redacted]
iter   3 val[redacted]
iter   3 val[redacted]
final  value[redacted]
converged[redacted]
> BA_fit[redacted]
$fit[redacted]

Call:[redacted]
stats::arima[redacted]seasonal = list(order = c(P, D,
    Q), peri[redacted]ean = FALSE, optim.control = list(trace = trc
,
    REPORT =[redacted]

Coefficients[redacted]
         ar[redacted]
      0.0925[redacted]
s.e.  0.0678[redacted]

sigma^2 esti[redacted]od = 233.41,  aic = -460.81

$degrees_of_[redacted]
[1] 214[redacted]

$ttable[redacted]
      Estima[redacted]
ar1     0.09[redacted]
xmean   0.01[redacted]

$AIC[redacted]
[1] -3.98056[redacted]

$AICc[redacted]
[1] -3.97078[redacted]

$BIC[redacted]
 [1] -4.9020[redacted]
```




```
> # Fit a[redacted]
> BA_fit [redacted]
initial  [redacted]
iter   2 [redacted]
iter   3 [redacted]
iter   4 [redacted]
iter   5 [redacted]
iter   5 [redacted]
iter   5 [redacted]
final  val[redacted]
converged [redacted]
initial  [redacted]
iter   2 [redacted]
iter   3 [redacted]
iter   4 [redacted]
iter   4 [redacted]
iter   4 [redacted]
final  val[redacted]
converged [redacted]
> BA_fit
$fit

Call:
stats::ari[redacted]asonal = list(order = c(P, D,
    Q), pe[redacted]n = FALSE, optim.control = list(trace = trc
,
    REPORT[redacted]

Coefficien[redacted]
         a[redacted]
      0.09[redacted]
s.e.  0.06[redacted]

sigma^2 es[redacted] = 233.41,  aic = -458.82
```

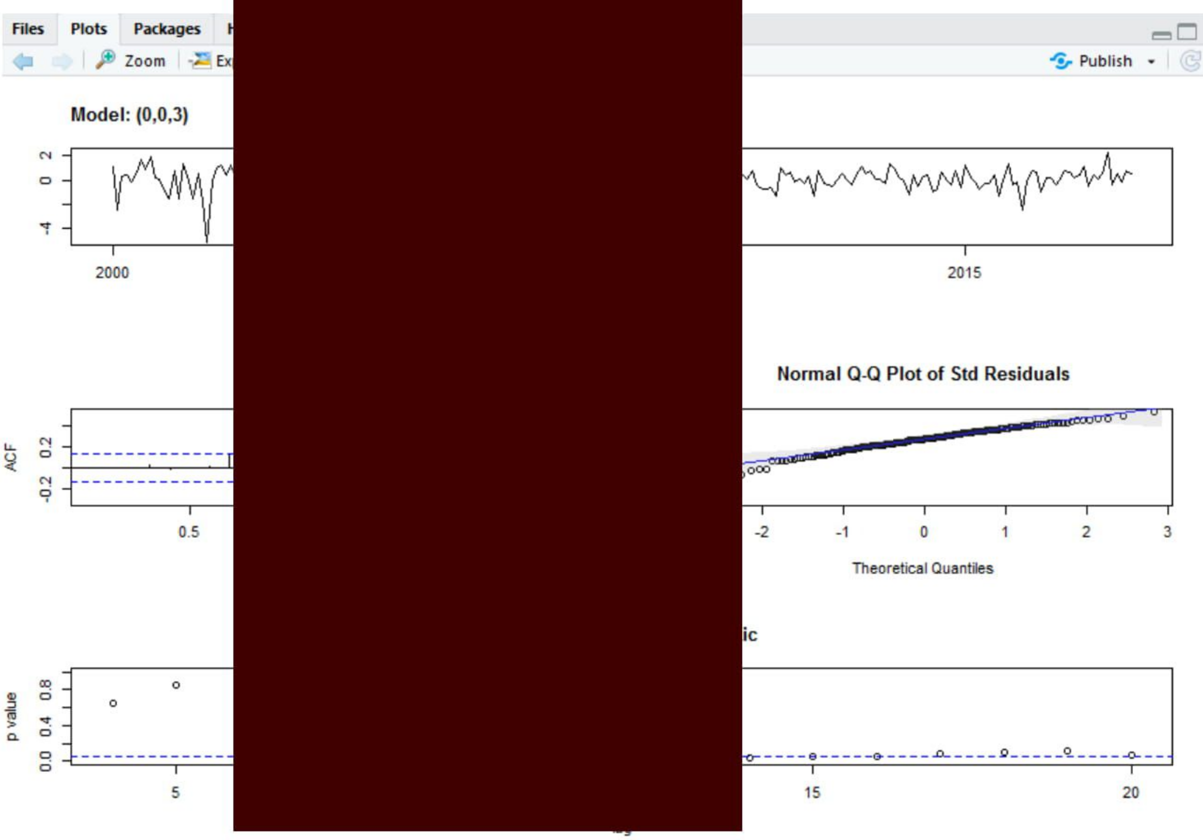
```
$degrees_of_fr[redacted]
[1] 213

$ttable
      Estimate [redacted]
ar1      0.0921 [redacted]
ar2      0.0048 [redacted]
xmean    0.0111 [redacted]

$AIC
[1] -3.971329 [redacted]

$AICc
[1] -3.961192 [redacted]

$BIC
[1] -4.92445 [redacted]
```



[redacted]

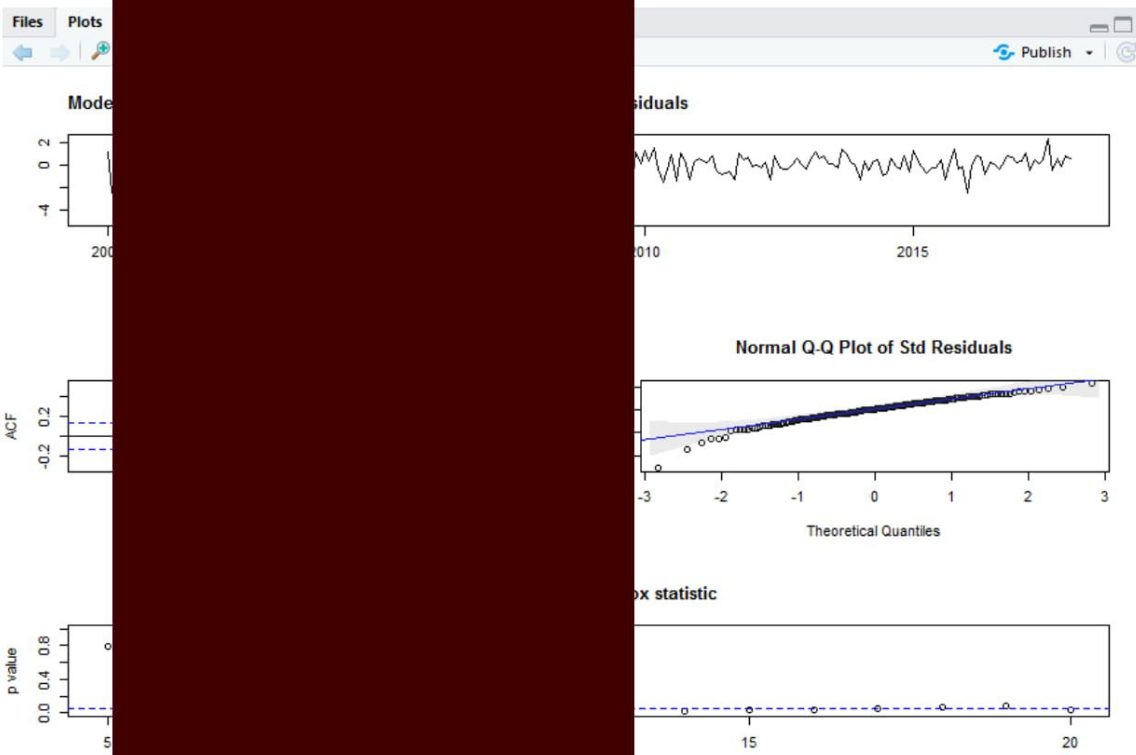
```
> # Fit an MA( [redacted]
> BA_fit <- sa [redacted]
initial  value [redacted]
iter   2 value [redacted]
iter   3 value [redacted]
iter   4 value [redacted]
iter   4 value [redacted]
iter   4 value [redacted]
final  value - [redacted]
converged
initial  value [redacted]
iter   2 value [redacted]
iter   3 value [redacted]
iter   3 value [redacted]
iter   3 value [redacted]
final  value - [redacted]
converged
> BA_fit
$fit [redacted]
```

```
Call:
stats::arima(x [redacted] sonal = list(order = c(P, D,
    Q), period [redacted] = FALSE, optim.control = list(trace = trc
,
    REPORT = 1, [redacted]

Coefficients:
         ma1 [redacted]
      0.0891  0[redacted]
s.e.  0.0681  0[redacted]

sigma^2 estimat[redacted] 233.65,  aic = -457.3

$degrees_of_fre[redacted]
[1] 212

$ttable
      Estimate [redacted]
ma1     0.0891 [redacted]
ma2     0.0096 [redacted]
ma3     0.0491 [redacted]
xmean   0.0111 [redacted]

$AIC
[1] -3.964339

$AICc
[1] -3.953757

$BIC
[1] -4.901834
```



```
> # Fit an MA([redacted]
> A_fit <- sar[redacted]
initial  value[redacted]
iter   2 value[redacted]
iter   3 value[redacted]
iter   4 value[redacted]
iter   5 value[redacted]
iter   5 value[redacted]
iter   5 value[redacted]
final  value -[redacted]
converged
initial  value[redacted]
iter   2 value[redacted]
iter   3 value[redacted]
iter   3 value[redacted]
iter   3 value[redacted]
final  value -[redacted]
converged
> # Fit an MA([redacted]
> BA_fit <- sa[redacted]
initial  value[redacted]
iter   2 value[redacted]
iter   3 value[redacted]
iter   4 value[redacted]
iter   5 value[redacted]
iter   5 value[redacted]
iter   5 value[redacted]
final  value -[redacted]
converged
initial  value[redacted]
iter   2 value[redacted]
iter   3 value[redacted]
iter   3 value[redacted]
iter   3 value[redacted]
final  value -[redacted]
converged
> BA_fit
$fit

Call:
stats::arima(x[redacted]sonal = list(order = c(P, D,
    Q), period[redacted] = FALSE, optim.control = list(trace = trc
,
    REPORT = 1[redacted]

Coefficients:
         ma1[redacted]
      0.0921[redacted]
s.e.  0.0684[redacted]

sigma^2 estima[redacted] = 233.74,  aic = -455.48

$degrees_of_fr[redacted]
[1] 211

$ttable
      Estimate[redacted]
ma1     0.0921[redacted]
ma2     0.0099[redacted]
ma3     0.0515[redacted]
ma4     0.0260[redacted]
xmean   0.0112[redacted]

$AIC
```

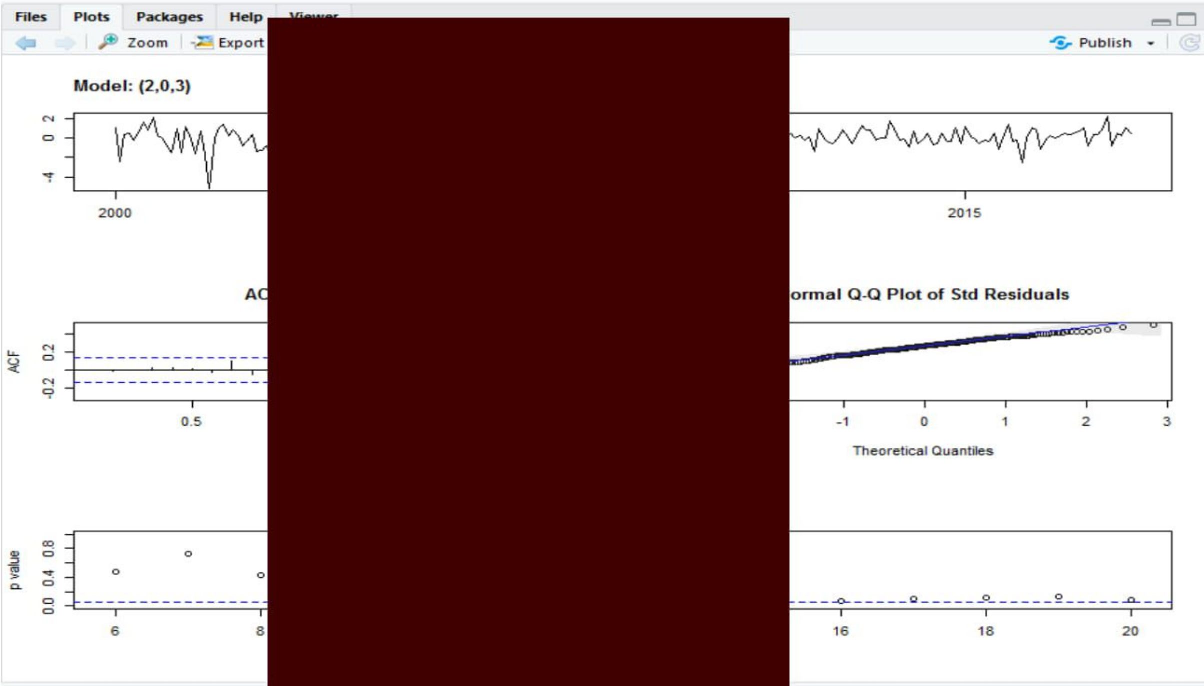
```
[1] -3.[redacted]

$AICc [redacted]
[1] -3.[redacted]

$BIC [redacted]
[1] -4.[redacted]
```




```
> # Fit[redacted]data rtn
> BA_fi[redacted]= 3)
initial[redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter [redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 1[redacted]
iter 2[redacted]
iter 2[redacted]
iter 2[redacted]
```

```
iter  23 value -2.513510
iter  24 value -2.513518
iter  25 value -2.513532
iter  26 value -2.513552
iter  27 value -2.513569
iter  28 value -2.513570
iter  29 value -2.513571
iter  30 value -2.513571
iter  31 value -2.513572
iter  32 value -2.513572
iter  33 value -2.513572
iter  34 value -2.513572
iter  34 value -2.513572
iter  34 value -2.513572
final  value -2.513572
converged
initial  value -2.500212
iter   2 value -2.500348
iter   3 value -2.500420
iter   4 value -2.500425
iter   5 value -2.500433
iter   6 value -2.500444
iter   7 value -2.500474
iter   8 value -2.500534
iter   9 value -2.500663
iter  10 value -2.500820
iter  11 value -2.501016
iter  12 value -2.501214
iter  13 value -2.501223
iter  14 value -2.501229
iter  15 value -2.501232
iter  16 value -2.501253
iter  17 value -2.501400
iter  18 value -2.501812
iter  19 value -2.501980
iter  20 value -2.502053
iter  21 value -2.502170
iter  22 value -2.502205
iter  23 value -2.502248
iter  24 value -2.502521
iter  25 value -2.502802
iter  26 value -2.503400
iter  27 value -2.504166
iter  28 value -2.506247
iter  29 value -2.506583
iter  30 value -2.506946
iter  31 value -2.507693
iter  32 value -2.507716
iter  33 value -2.508068
iter  34 value -2.508405
iter  35 value -2.508595
iter  36 value -2.508766
iter  37 value -2.509012
iter  38 value -2.509212
iter  39 value -2.509852
iter  40 value -2.512441
iter  41 value -2.513771
iter  42 value -2.515239
iter  43 value -2.515856
iter  44 value -2.516091
iter  45 value -2.516395
iter  46 value -2.516587
iter  47 value -2.516689
iter  48 value -2.516707
```

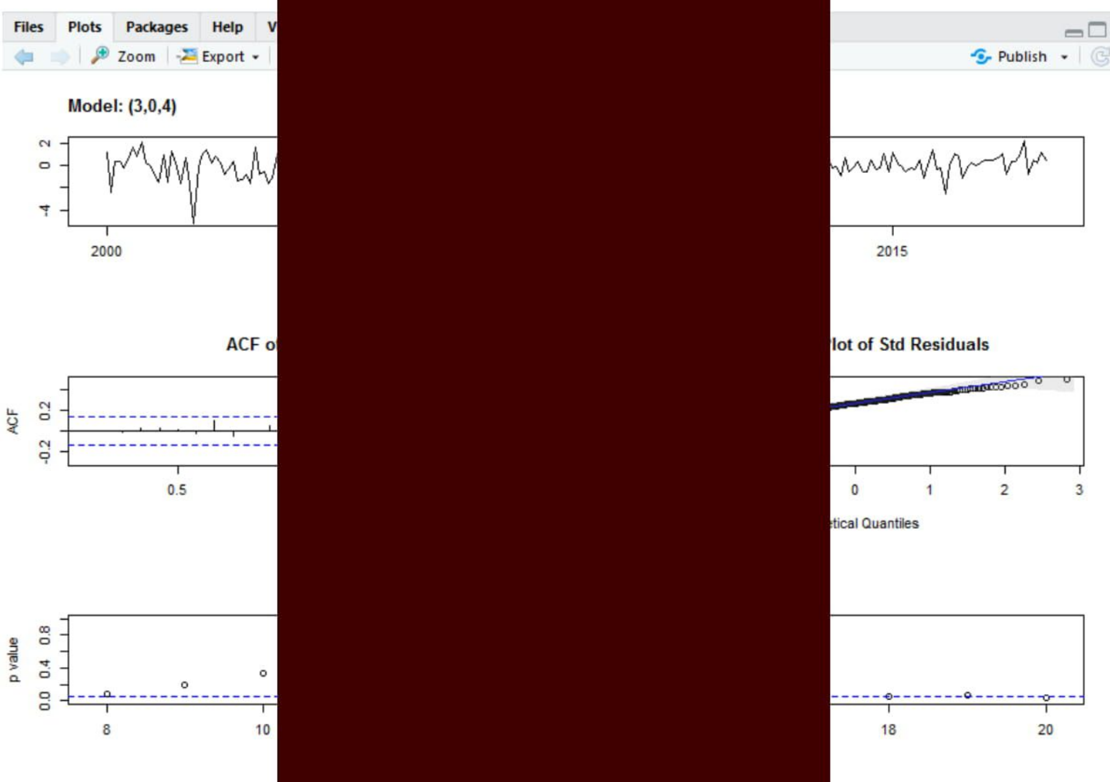
```
iter  49 value -2.516711
iter  50 value -2.516713
iter  [redacted]
iter  [redacted]
iter  [redacted]
final [redacted]
conver[redacted]
> BA_f[redacted]
$fit  [redacted]

Call: [redacted]
stats:[redacted] q), seasonal = list(order = c(P, D,
    Q)[redacted]ude.mean = FALSE, optim.control = list(trace = trc
,
    RE[redacted]

Coeffi[redacted]
      [redacted]   ma3   xmean
      [redacted] 0.1321  0.0112
s.e.  [redacted] 0.0778  0.0064

sigma^[redacted]ihood = 237.12,  aic = -460.24

$degre[redacted]
[1] 21[redacted]

$ttabl[redacted]

ar1   [redacted]
ar2   [redacted]
ma1   [redacted]
ma2   [redacted]
ma3   [redacted]
xmean [redacted]

$AIC  [redacted]
[1] -3[redacted]

$AICc [redacted]
[1] -3[redacted]

$BIC  [redacted]
[1] -4[redacted]
```




```
> # Fit an ARMA(3[redacted]
> BA_fit <- sarim[redacted]
initial  value -2[redacted]
iter   2 value -2[redacted]
iter   3 value -2[redacted]
iter   4 value -2[redacted]
iter   5 value -2[redacted]
iter   6 value -2[redacted]
iter   7 value -2[redacted]
iter   8 value -2[redacted]
iter   9 value -2[redacted]
iter  10 value -2[redacted]
iter  11 value -2[redacted]
iter  12 value -2[redacted]
iter  13 value -2[redacted]
iter  14 value -2[redacted]
iter  15 value -2[redacted]
iter  16 value -2[redacted]
iter  17 value -2[redacted]
iter  18 value -2[redacted]
iter  19 value -2[redacted]
iter  20 value -2[redacted]
iter  20 value -2[redacted]
iter  20 value -2[redacted]
final  value -2.5[redacted]
converged
initial  value -2[redacted]
iter   2 value -2[redacted]
iter   3 value -2[redacted]
iter   4 value -2[redacted]
iter   5 value -2[redacted]
iter   6 value -2[redacted]
iter   7 value -2[redacted]
iter   8 value -2[redacted]
iter   9 value -2[redacted]
iter  10 value -2[redacted]
iter  11 value -2[redacted]
iter  12 value -2[redacted]
iter  13 value -2[redacted]
```

```
iter  14 value -2.501518
iter  15 value -2.501543
iter  16 value -2.501579
iter  17 value -2.501631
iter  18 value -2.501799
iter  19 value -2.501854
iter  20 value -2.501888
iter  21 value -2.501950
iter  22 value -2.502035
iter  23 value -2.502268
iter  24 value -2.502874
iter  25 value -2.502885
iter  26 value -2.504055
iter  27 value -2.504526
iter  28 value -2.504543
iter  29 value -2.504992
iter  30 value -2.505170
iter  31 value -2.505391
iter  32 value -2.505616
iter  33 value -2.506018
iter  34 value -2.506365
iter  35 value -2.507189
iter  36 value -2.507338
iter  37 value -2.507345
iter  38 value -2.507773
iter  39 value -2.508413
iter  40 value -2.509474
iter  41 value -2.510496
iter  42 value -2.511216
iter  43 value -2.511868
iter  44 value -2.513127
iter  45 value -2.513212
iter  46 value -2.513984
iter  47 value -2.515371
iter  48 value -2.515542
iter  49 value -2.516381
iter  50 value -2.516608
iter  51 value -2.516827
iter  52 value -2.516842
iter  53 value -2.516847
iter  54 value -2.516848
iter  55 value -2.516848
iter  55 value -2.516848
iter  55 value -2.516848
final [redacted]
converg[redacted]
> BA_fi[redacted]
$fit

Call:
stats::a[redacted]), seasonal = list(order = c(P, D,
    Q), [redacted]e.mean = FALSE, optim.control = list(trace = trc
,
    REP[redacted]

Coeffic[redacted]
      [redacted]      ma2     ma3      ma4   xmean
      0[redacted]0.8836  0.2420  -0.0037  0.0112
s.e.  2[redacted]0.6858  1.9668   0.3165  0.0063

sigma^2[redacted]ihood = 237.15,  aic = -456.3

$degree[redacted]
[1] 208[redacted]
```

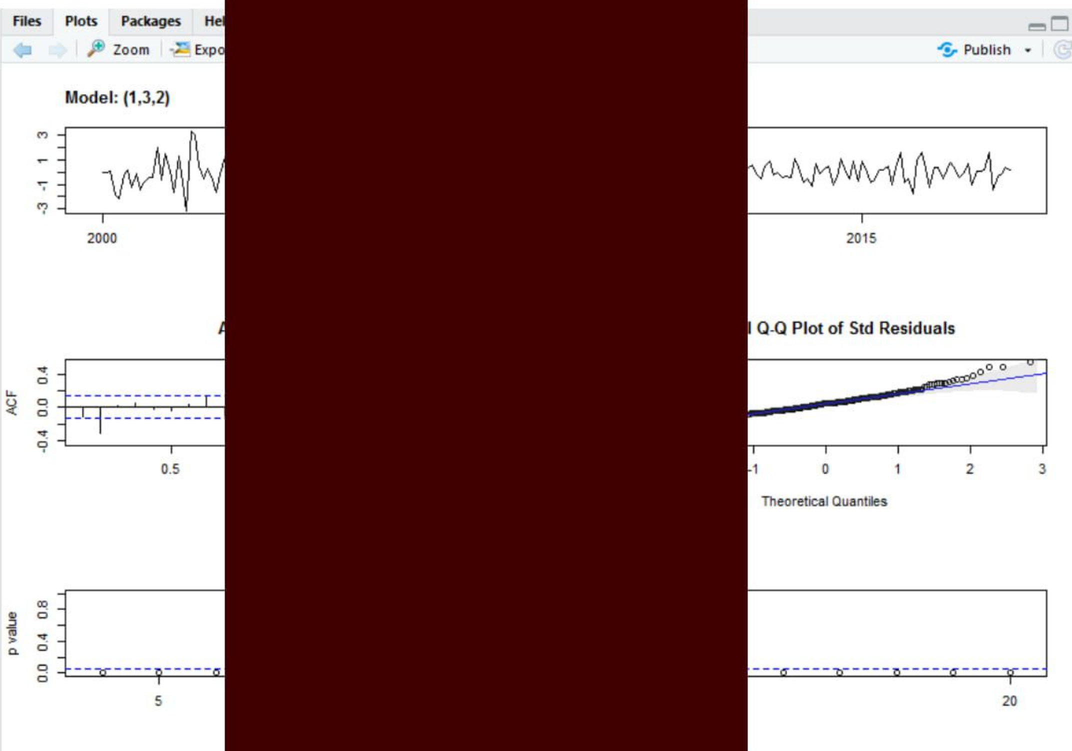
```
$ttable
      Estimate [redacted]
ar1     0.3096 2.1[redacted]
ar2    -0.8520 0.8[redacted]
ar3    -0.1016 1.9[redacted]
ma1    -0.2285 2.1[redacted]
ma2     0.8836 0.6[redacted]
ma3     0.2420 1.9[redacted]
ma4    -0.0037 0.3[redacted]
xmean   0.0112 0.0[redacted]

$AIC
[1] -3.977641

$AICc
[1] -3.964336

$BIC
[1] -4.85263
```




```
> # Fit an ARIMA([redacted]
> BA_fit <- sarima[redacted]
initial  value -1.[redacted]
iter   2 value -1.[redacted]
iter   3 value -1.[redacted]
iter   4 value -1.[redacted]
iter   5 value -1.[redacted]
iter   6 value -1.[redacted]
iter   7 value -1.[redacted]
iter   8 value -2.[redacted]
iter   9 value -2.[redacted]
iter  10 value -2.[redacted]
```

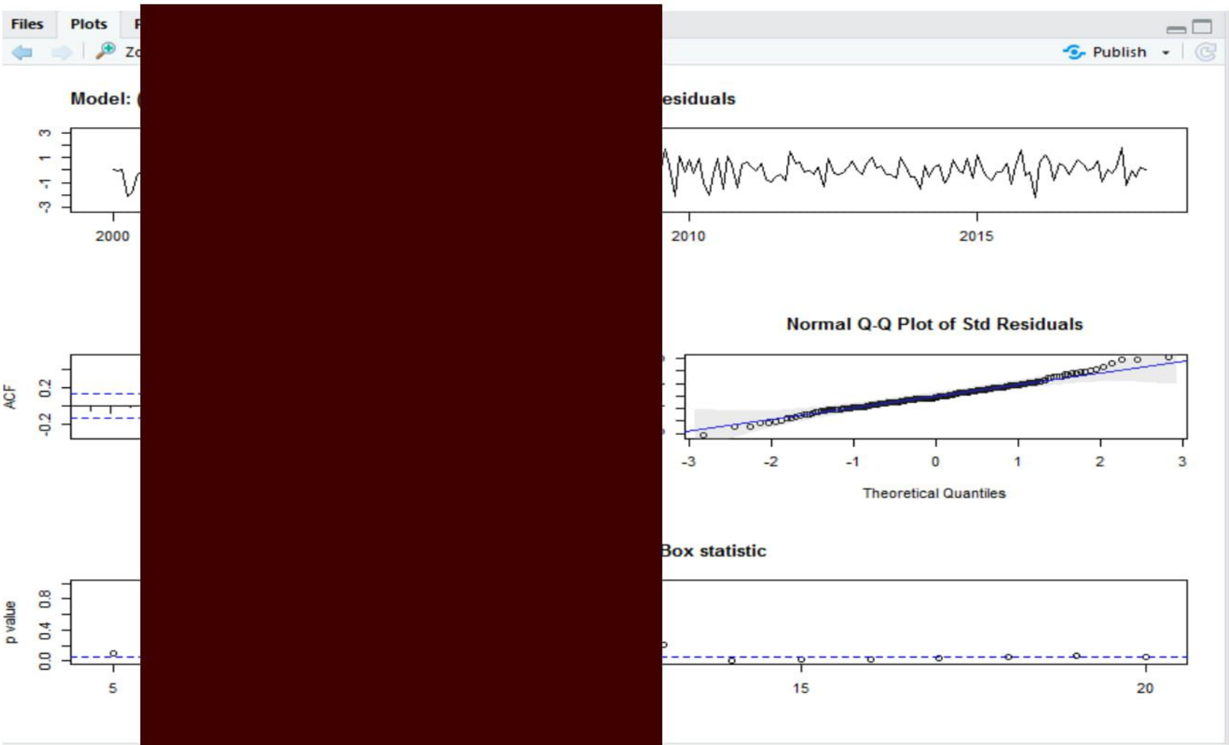
```
iter  11 value -2.185620
iter  12 value -2.236023
iter  13 value -2.244500
iter  14 value -2.251062
iter  15 value -2.254496
iter  16 value -2.257668
iter  17 value -2.262104
iter  18 value -2.265271
iter  19 value -2.267407
iter  20 value -2.268683
iter  21 value -2.269991
iter  22 value -2.270901
iter  23 value -2.271324
iter  24 value -2.271773
iter  25 value -2.272299
iter  26 value -2.272306
iter  27 value -2.272313
iter  28 value -2.272342
iter  29 value -2.272343
iter  30 value -2.272348
iter  31 value -2.272359
iter  32 value -2.273955
iter  33 value -2.274233
iter  34 value -2.274344
iter  34 value -2.274344
iter  34 value -2.274344
final  value -2.274344
converged
initial  value -2.242270
iter   2 value -2.247272
iter   3 value -2.261307
iter   4 value -2.261601
iter   5 value -2.265804
iter   6 value -2.266020
iter   7 value -2.266322
iter   8 value -2.266381
iter   9 value -2.266383
iter  10 value -2.266386
iter  11 value -2.266391
iter  12 valu[redacted]
iter  12 valu[redacted]
iter  13 valu[redacted]
iter  14 valu[redacted]
iter  14 valu[redacted]
iter  14 valu[redacted]
final  value -[redacted]
converged
> BA_fit
$fit

Call:
stats::arima(x[redacted] = list(order = c(P, D,
    Q), perio[redacted]tim.control = list(trace = trc,
    REPORT = [redacted]

Coefficients:[redacted]
         ar1 [redacted]
      -0.4546 [redacted]
s.e.   0.0619 [redacted]

sigma^2 estim[redacted].51,  aic = -353.01

$degrees_of_f[redacted]
[1] 210
```

```
$ttable
    Estimate [redacted]
ar1  -0.4546 0.[redacted]
ma1  -1.9978 0.[redacted]
ma2   1.0000 0.[redacted]

$AIC
[1] -3.585728[redacted]

$AICc
[1] -3.575591[redacted]

$BIC
[1] -4.538849[redacted]
```



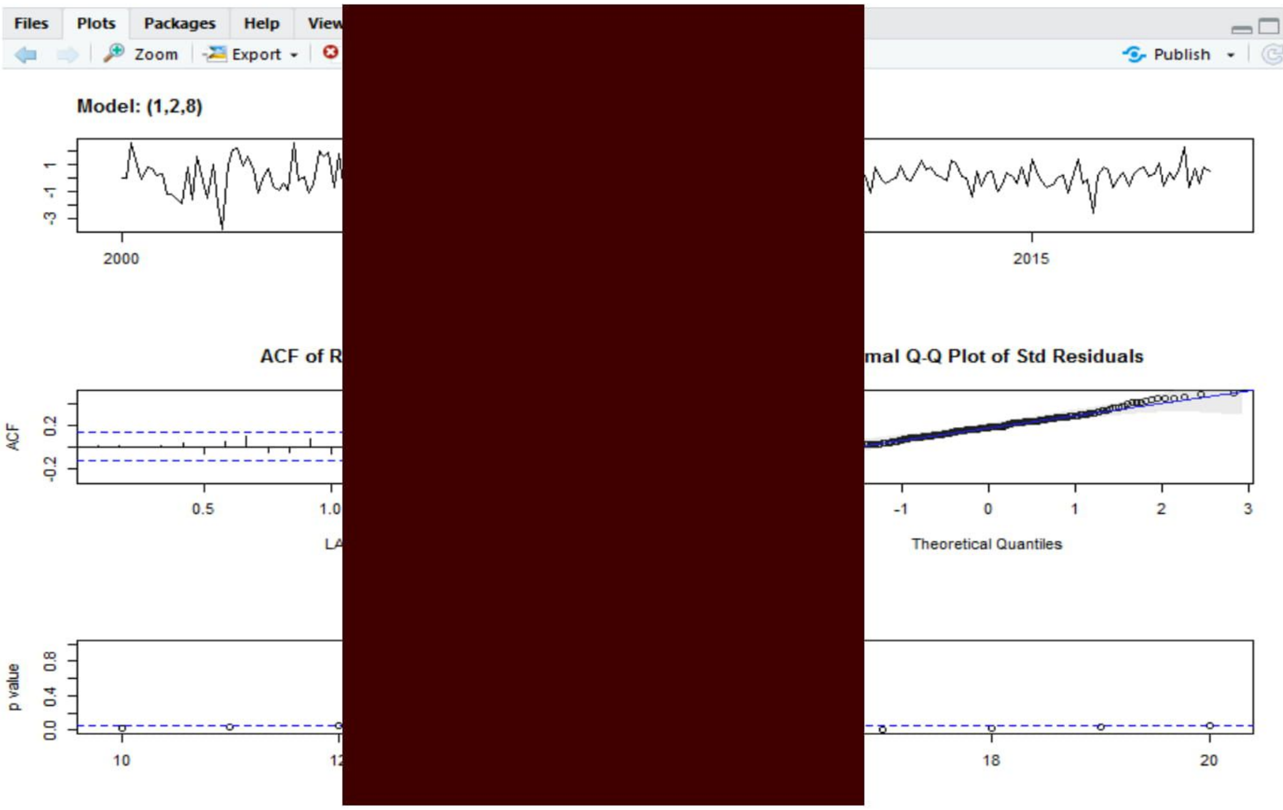

```
> # Fit an ARI[redacted]rtn
> BA_fit <- sa[redacted]
initial  value [redacted]
iter   2 value [redacted]
iter   3 value [redacted]
iter   4 value [redacted]
iter   5 value [redacted]
iter   6 value [redacted]
iter   7 value [redacted]
iter   8 value [redacted]
iter   9 value [redacted]
iter  10 value [redacted]
iter  11 value [redacted]
iter  12 value [redacted]
iter  13 value [redacted]
iter  14 value [redacted]
iter  15 value [redacted]
iter  16 value [redacted]
iter  17 value [redacted]
iter  18 value [redacted]
```

```
iter  19 value -[redacted]
iter  20 value -[redacted]
iter  21 value -[redacted]
iter  22 value -[redacted]
iter  23 value -[redacted]
iter  24 value -[redacted]
iter  25 value -[redacted]
iter  26 value -[redacted]
iter  27 value -[redacted]
iter  28 value -[redacted]
iter  29 value -[redacted]
iter  29 value -[redacted]
final  value -2.[redacted]
converged
initial  value -[redacted]
iter   2 value -[redacted]
iter   3 value -[redacted]
iter   4 value -[redacted]
iter   5 value -[redacted]
iter   6 value -[redacted]
iter   7 value -[redacted]
iter   8 value -[redacted]
iter   9 value -[redacted]
iter  10 value -[redacted]
iter  10 value -[redacted]
final  value -2.[redacted]
converged
> BA_fit
$fit

Call:
stats::arima(x = [redacted]al = list(order = c(P, D,
    Q), period = [redacted]optim.control = list(trace = trc,
    REPORT = 1, [redacted]

Coefficients:
         ar1 [redacted]
      0.0565  -2[redacted]
s.e.  0.0939   0[redacted]

sigma^2 estimate[redacted]03.35,  aic = -396.71

$degrees_of_free[redacted]
[1] 209

$ttable
    Estimate [redacted]
ar1   0.0565 0.0[redacted]
ma1  -2.7053 0.0[redacted]
ma2   2.4234 0.1[redacted]
ma3  -0.7177 0.0[redacted]

$AIC
[1] -3.790261

$AICc
[1] -3.779679

$BIC
[1] -4.727756
```




```
> # Fit an [redacted]ata rtn
> BA_fit <[redacted]
initial  va[redacted]
iter   2 va[redacted]
iter   3 va[redacted]
iter   4 va[redacted]
iter   5 va[redacted]
iter   6 va[redacted]
iter   7 va[redacted]
iter   8 va[redacted]
iter   9 va[redacted]
iter  10 va[redacted]
iter  11 va[redacted]
iter  12 va[redacted]
iter  13 va[redacted]
iter  14 va[redacted]
iter  15 va[redacted]
iter  16 va[redacted]
iter  17 va[redacted]
iter  18 va[redacted]
iter  19 va[redacted]
iter  20 va[redacted]
iter  21 va[redacted]
iter  22 va[redacted]
iter  23 va[redacted]
iter  24 va[redacted]
iter  25 va[redacted]
iter  26 va[redacted]
iter  27 va[redacted]
iter  27 va[redacted]
iter  27 va[redacted]
final  valu[redacted]
converged [redacted]
initial  va[redacted]
iter   2 va[redacted]
```

```
iter   3 value -2[redacted]
iter   4 value -2[redacted]
iter   5 value -2[redacted]
iter   6 value -2[redacted]
iter   7 value -2[redacted]
iter   8 value -2[redacted]
iter   9 value -2[redacted]
iter  10 value -2[redacted]
iter  11 value -2[redacted]
iter  12 value -2[redacted]
iter  13 value -2[redacted]
iter  14 value -2[redacted]
iter  15 value -2[redacted]
iter  16 value -2[redacted]
iter  17 value -2[redacted]
iter  18 value -2[redacted]
iter  19 value -2[redacted]
iter  20 value -2[redacted]
iter  21 value -2[redacted]
iter  22 value -2[redacted]
iter  22 value -2[redacted]
iter  22 value -2[redacted]
final  value -2.[redacted]
converged
> BA_fit
$fit

Call:
stats::arima(x = [redacted]al = list(order = c(P, D,
    Q), period = [redacted]optim.control = list(trace = trc,
    REPORT = 1, [redacted]

Coefficients:
   ar1      ma1  [redacted]   ma6      ma7     ma8
-0.6105  -1.2710 [redacted]  0.2142  -0.1488  0.0621
s.e. 0.1785  0.18[redacted]2  0.1673   0.1442  0.0790

sigma^2 estimate[redacted]22.93,aic = -425.86

$degrees_of_free[redacted]
[1] 205

$ttable
    Estimate [redacted]
ar1  -0.6105 0.17[redacted]
ma1  -1.2710 0.18[redacted]
ma2  -0.3784 0.32[redacted]
ma3   0.6466 0.15[redacted]
ma4   0.0325 0.14[redacted]
ma5  -0.1563 0.13[redacted]
ma6   0.2142 0.16[redacted]
ma7  -0.1488 0.14[redacted]
ma8   0.0621 0.07[redacted]

$AIC
[1] -3.914096

$AICc
[1] -3.899868

$BIC
[1] -4.773459
```



[redacted]

The AICs and BICs from each run are summarized as below:

Model	[redacted]	
AR(1)	[redacted]	
AR(2)	[redacted]	
MA(3)	[redacted]	
MA(4)	[redacted]	
ARMA (2,3)	[redacted]	
ARMA(3,4)	[redacted]	
ARIMA(1,3,2)	[redacted]	
ARIMA (1,3,3)	[redacted]	
ARIMA(1,2,8)	[redacted]	

ARMA(2,3) has the [redacted] e for the data in this case.

Below is the summa [redacted] stocks. The result shows ARMA (2,3) is a good candidate [redacted] esiduals with some autocorrelations exists, Normal Q-Q [redacted] s' autocorrelations of residuals are NOT significantly d [redacted]

	AR(1)	AR(2)	MA(3)
Standardized residuals	[redacted] se	[redacted] e	L [redacted]
ACF of residuals	So [redacted] exist	Sor [redacted] exist	Som [redacted] xist
Normal Q-Q plot	Cl [redacted] ution	Clo [redacted] tion	Clos [redacted] ion
p.values for Ljung-Box statistics	Au [redacted] duals are [redacted] dif [redacted]	Aut [redacted] uals are [redacted] diff [redacted]	Auto [redacted] uals are N [redacted] diffe [redacted]

	[redacted]	[redacted]	ARMA (3,4)
Standardized residuals	[redacted] se	L [redacted]	Lo [redacted]
ACF of residuals	So [redacted] exist	Som [redacted] xist	Some [redacted] ist
Normal Q-Q plot	Cl [redacted] ution	Clos [redacted] ion	Close [redacted] on
p.values for Ljung-Box statistics	Aut [redacted] duals are [redacted] ferent fro [redacted]	Auto [redacted] resi [redacted] from 0	Autoc [redacted] als are NC [redacted] ent from ([redacted]

	ARIMA(1,3,2)	ARIMA(1,3,3)	[redacted]
Standardized residuals	[redacted] e	Lo [redacted]	Lo [redacted]
ACF of residuals	Sor [redacted] exist	Some [redacted] ist	Some [redacted] ist
Normal Q-Q plot	Clo [redacted] tion	Close [redacted] on	Close [redacted] on
p.values for Ljung-Box statistics	Aut [redacted] uals are [redacted] fror [redacted]	Auto [redacted] resid [redacted] signif [redacted] 0	Autoc [redacted] ls are sig [redacted] om 0