Econometria de Séries Temporais*

Comentários sobre as resoluções propostas para os exercícios sobre seleção de modelos e diagnóstico de resíduos

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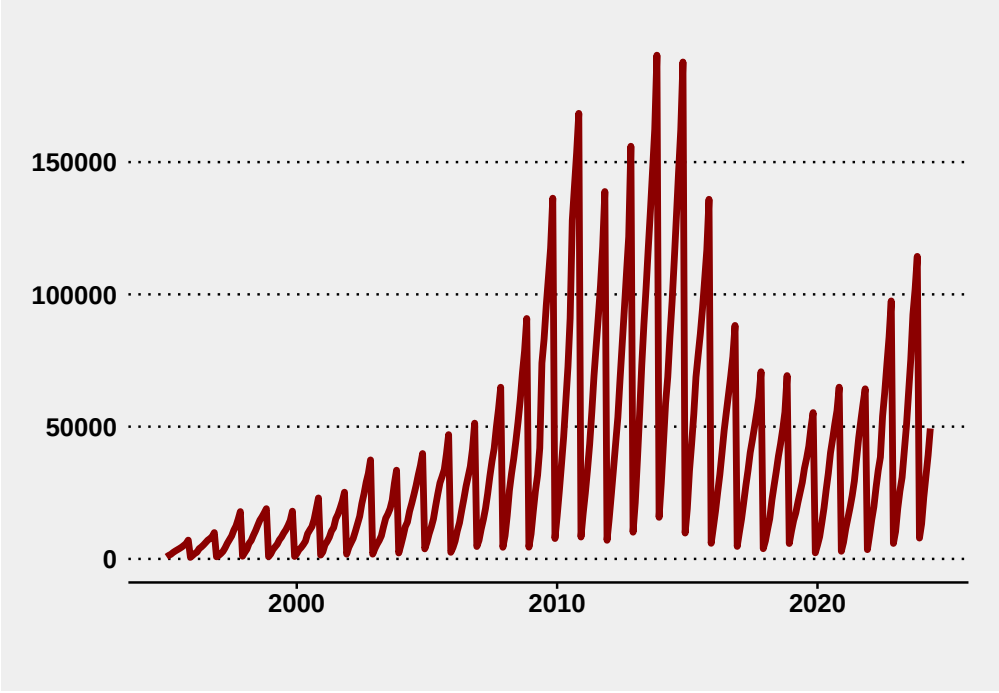
Questão 1

No que tange a definição (ainda que não formal) das hipóteses dos testes, é importante lembrar que elas dizem respeito ao comportamento dos erros (e não dos resíduos).

a)



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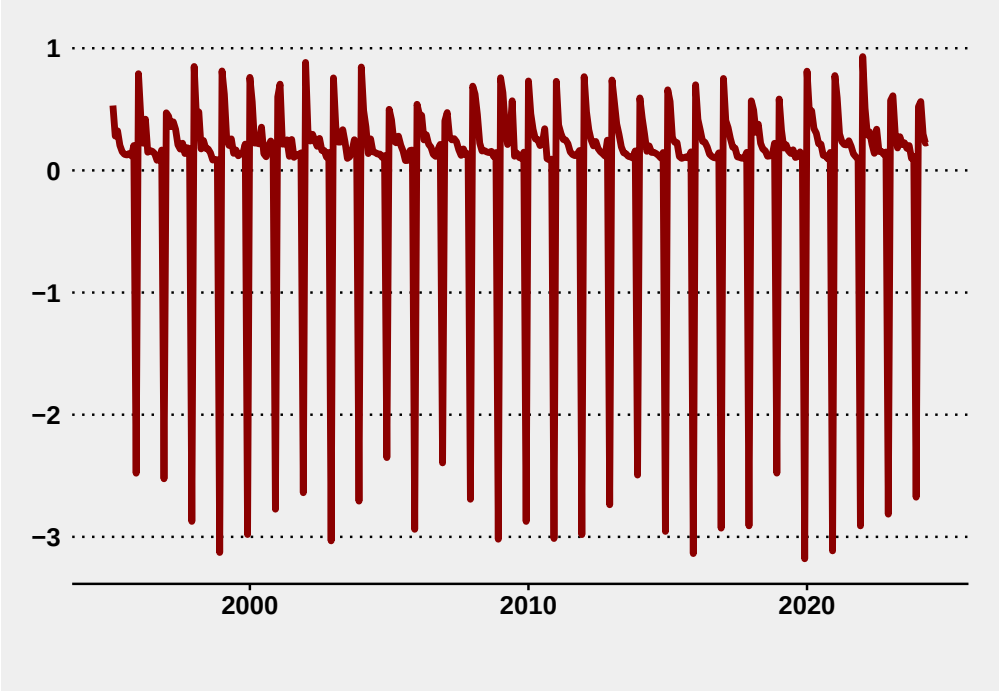
b)



c)

```
##
## Call:
## arima(x = dbndes, order = c(1, 0, 1))
##
## Coefficients:
##          ar1      ma1  intercept
##       0.5054  -0.9538     0.0073
## s.e.  0.0499   0.0136     0.0041
##
## sigma^2 estimated as 0.5944:  log likelihood = -408.61,  aic = 825.23
```

```
##
## Call:
## arima(x = dbndes, order = c(2, 0, 2))
##
## Coefficients:
##          ar1      ar2      ma1     ma2  intercept
##       1.4174  -0.6738  -1.8947  0.9438     0.0083
## s.e.  0.0414   0.0413   0.0214  0.0207     0.0072
##
## sigma^2 estimated as 0.4931:  log likelihood = -377.06,  aic = 766.12
```

```
##
## Call:
```

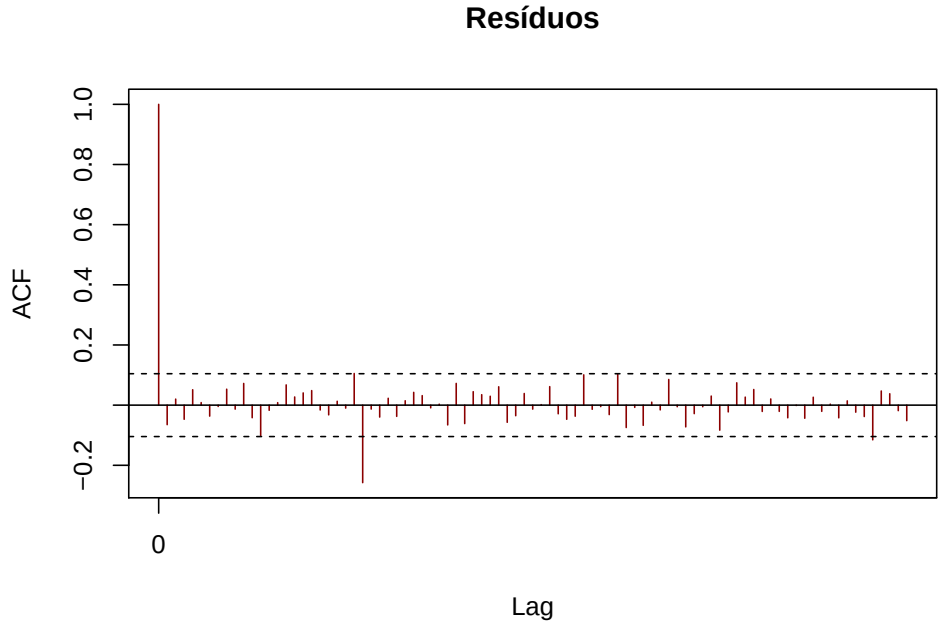
```
## arima(x = dbndes, order = c(2, 0, 2), seasonal = c(1, 1, 0))
##
## Coefficients:
##           ar1     ar2     ma1      ma2     sar1
##       -0.0332  0.8835  0.0098  -0.9901  -0.3827
## s.e.   0.0349  0.0355  0.0197   0.0196   0.0506
##
## sigma^2 estimated as 0.01325:  log likelihood = 249.82,  aic = -487.64
```

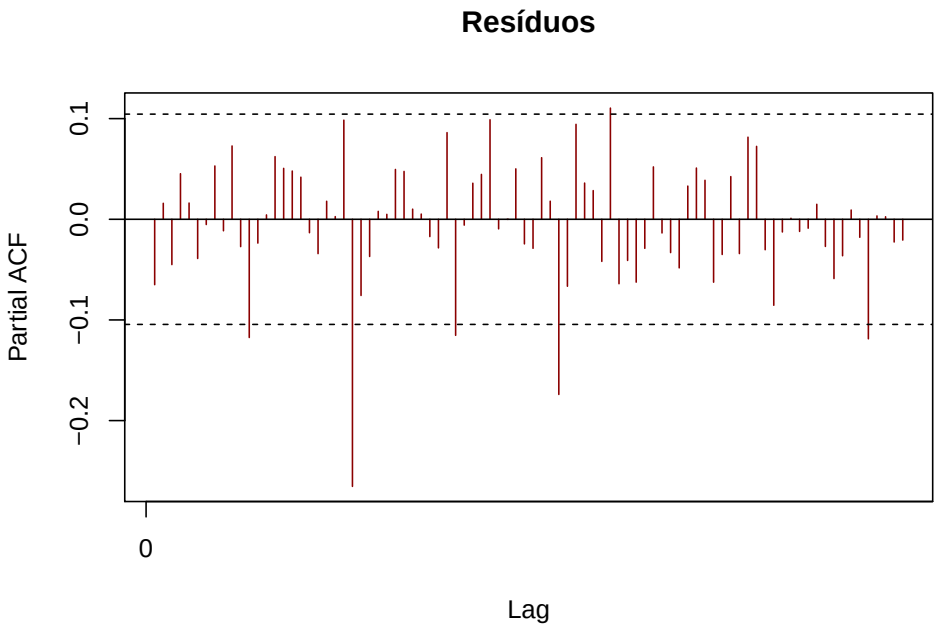
```
##
## Call:
## arima(x = dbndes, order = c(1, 0, 0), seasonal = c(1, 0, 0))
##
## Coefficients:
##           ar1    sar1  intercept
##       -0.0518  0.9874     0.0245
## s.e.   0.0532  0.0044     0.2064
##
## sigma^2 estimated as 0.01664:  log likelihood = 199.32,  aic = -390.64
```

d)

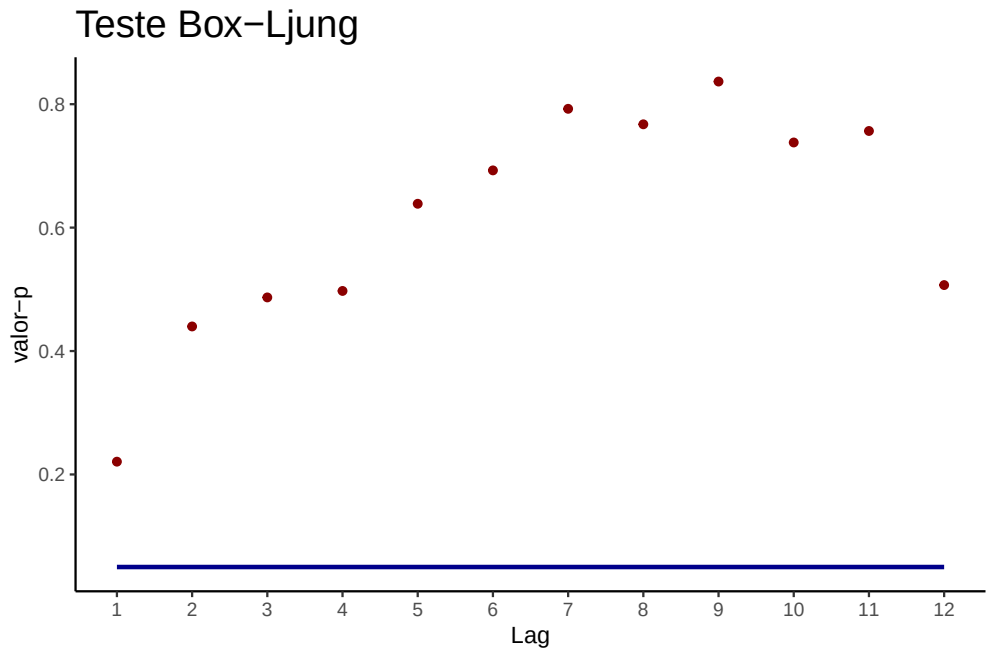
```
## [1] -0.006771663
```

e)




Resíduos
Partial ACF
0.1
0.0
−0.1
−0.2
0
Lag

f)


Teste Box−Ljung
valor−p
0.8
0.6
0.4
0.2
1
2
3
4
5
6
7
8
9
10
11
12
Lag

g)

```
##
##  Jarque Bera Test
##
## data:  resids
## X-squared = 330.96, df = 2, p-value < 2.2e-16
```

h)

```
##
##  Shapiro-Wilk normality test
##
## data:  resids
## W = 0.89589, p-value = 8.826e-15
```

i)

```
##
##  ARCH LM-test; Null hypothesis: no ARCH effects
##
## data:  resids
## Chi-squared = 82.666, df = 12, p-value = 1.277e-12
```

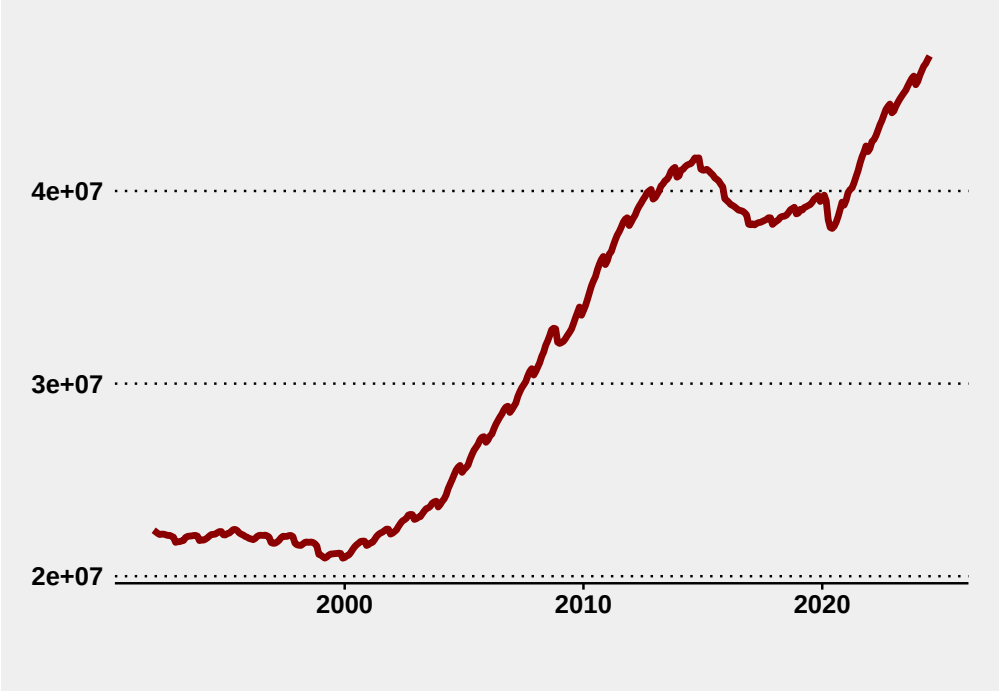
j)

```
##
##  RESET test
##
## data:  resids ~ 0
## RESET = 0, df1 = 2, df2 = 350, p-value = 1
```

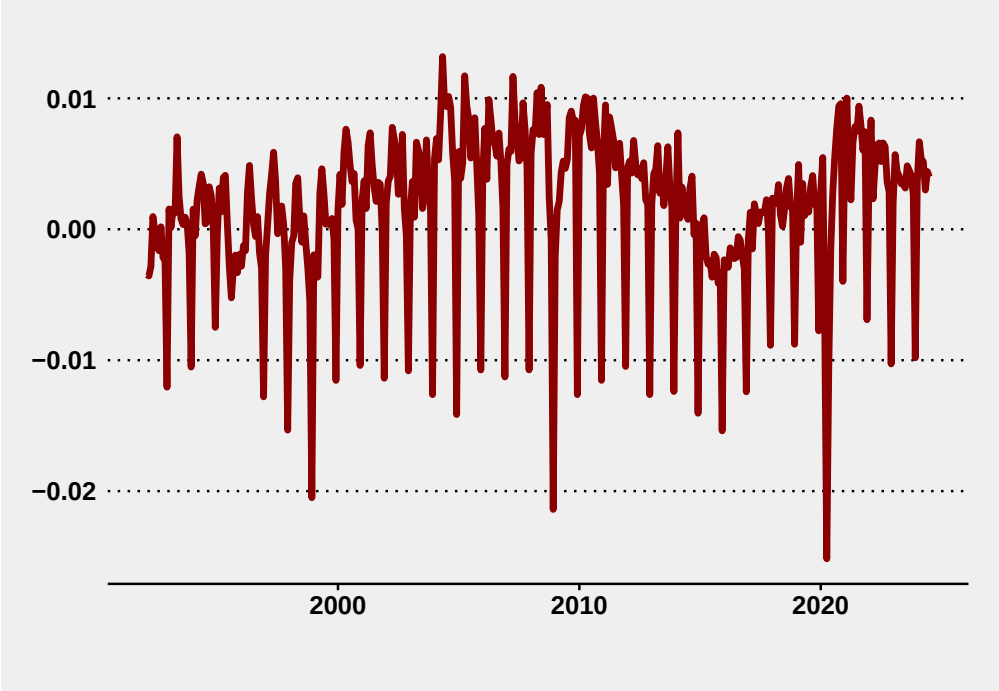
Questão 2

No que tange a definição (ainda que não formal) das hipóteses dos testes, é importante lembrar que elas dizem respeito ao comportamento dos erros (e não dos resíduos).

a)



b)



c)

```
##
## Call:
## arima(x = dcaged, order = c(1, 0, 1))
##
## Coefficients:
##          ar1      ma1  intercept
##       0.5442  -0.1509     0.0019
## s.e.  0.1067   0.1278     0.0005
##
## sigma^2 estimated as 2.585e-05:  log likelihood = 1506.36,  aic = -3004.73
```

```
##
## Call:
## arima(x = dcaged, order = c(2, 0, 2))
##
## Coefficients:
##          ar1     ar2     ma1      ma2  intercept
##       0.0613  0.3358  0.3384  -0.1771     0.0019
## s.e.  0.3252  0.1547  0.3285   0.1089     0.0005
##
## sigma^2 estimated as 2.577e-05:  log likelihood = 1506.97,  aic = -3001.94
```

```
##
## Call:
```

```
## arima(x = dcaged, order = c(2, 0, 2), seasonal = c(1, 1, 0))
##
## Coefficients:
##          ar1     ar2     ma1     ma2     sar1
##       0.5566  0.1225  0.0304  0.0200  -0.3630
## s.e.  0.6161  0.4652  0.6150  0.1292   0.0472
##
## sigma^2 estimated as 7.22e-06:  log likelihood = 1700.01,  aic = -3388.03
```

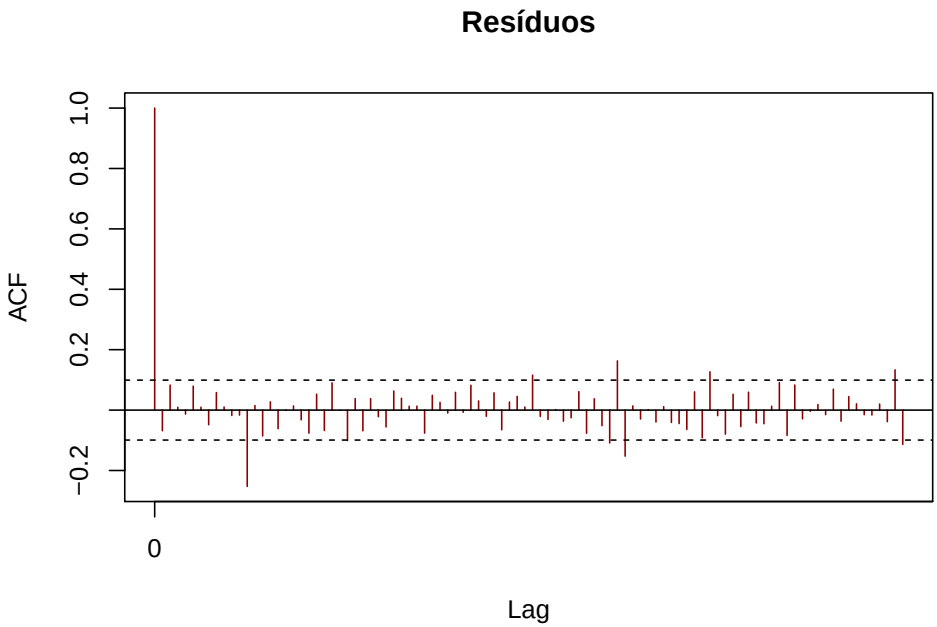
```
##
## Call:
## arima(x = dcaged, order = c(1, 0, 0), seasonal = c(1, 0, 0))
##
## Coefficients:
##          ar1    sar1  intercept
##       0.6363  0.8407     0.0015
## s.e.  0.0393  0.0257     0.0021
##
## sigma^2 estimated as 7.788e-06:  log likelihood = 1732.76,  aic = -3457.52
```

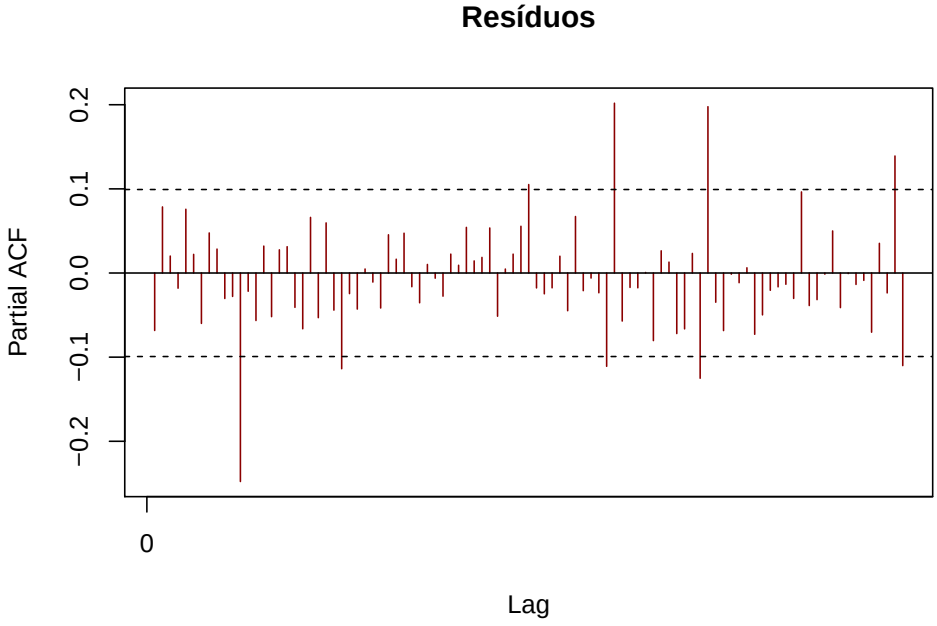
```
##
## Call:
## arima(x = dcaged, order = c(1, 0, 1), seasonal = c(0, 1, 2))
##
## Coefficients:
##          ar1      ma1     sma1     sma2
##       0.7902  -0.1742  -0.5936  -0.1360
## s.e.  0.0449   0.0714   0.0514   0.0517
##
## sigma^2 estimated as 6.102e-06:  log likelihood = 1728.55,  aic = -3447.11
```

d)

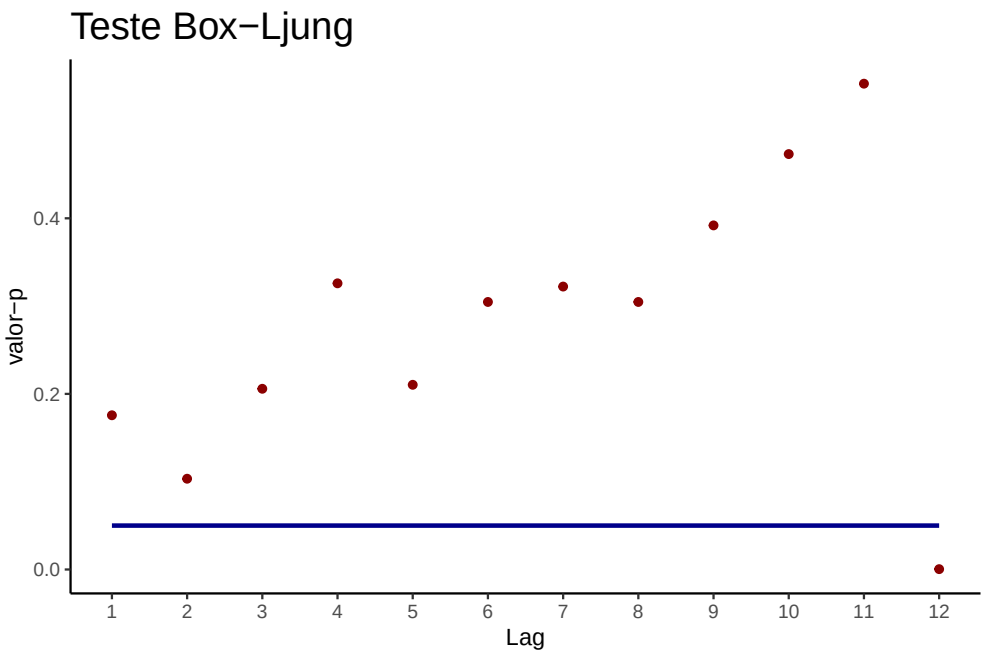
```
## [1] 6.448369e-05
```

e)


Resíduos
ACF
1.0
0.8
0.6
0.4
0.2
−0.2
0
Lag


Resíduos
Partial ACF
0.2
0.1
0.0
−0.1
−0.2
0
Lag

f)



g)

```
##
##  Jarque Bera Test
##
## data:  resids
## X-squared = 4927.2, df = 2, p-value < 2.2e-16
```

h)

```
##
##  Shapiro-Wilk normality test
##
## data:  resids
## W = 0.86065, p-value < 2.2e-16
```

i)

```
##
##  ARCH LM-test; Null hypothesis: no ARCH effects
##
## data:  resids
## Chi-squared = 60.476, df = 12, p-value = 1.848e-08
```

j)

```
##
##  RESET test
##
```

```
## data:  resids ~ 0
## RESET = 0, df1 = 2, df2 = 388, p-value = 1
```