Preprocessing Data

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Contents

1 National Data Set

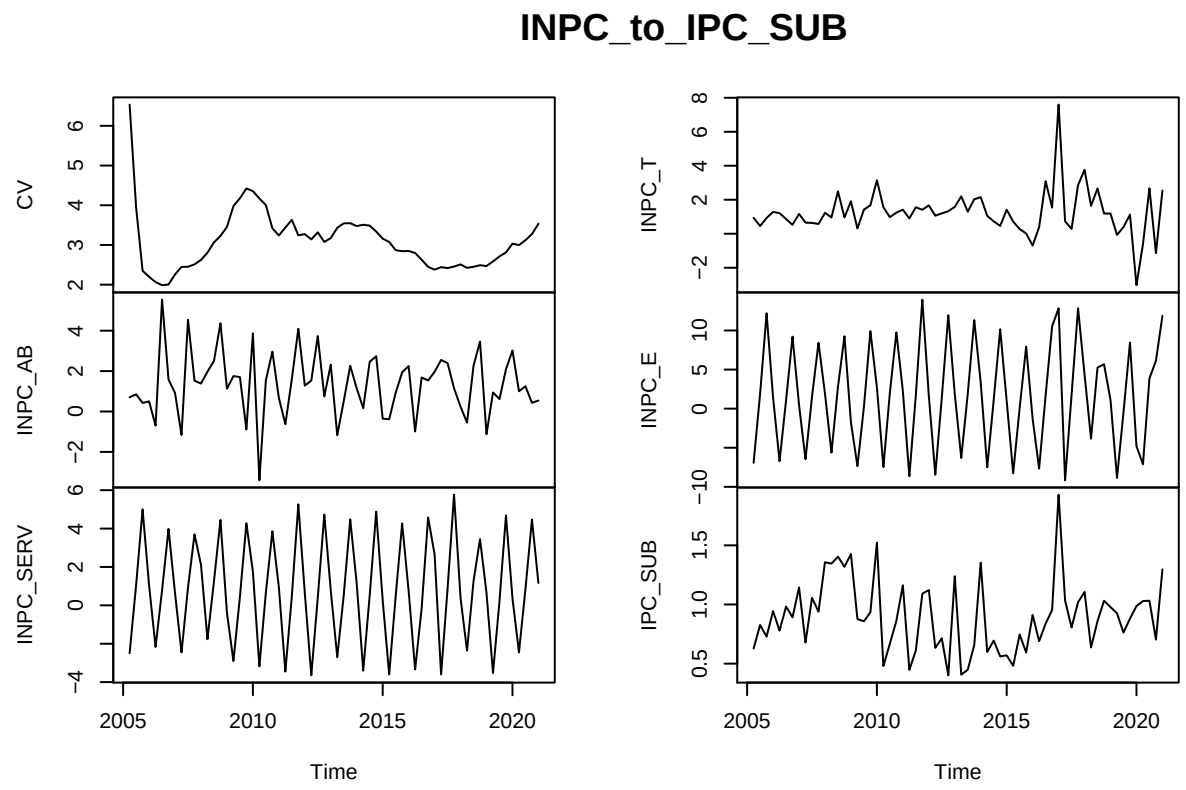
1.1 Loading and visualizing the data

```
BDT2 <- read_excel("BDF NACIONAL.xlsx")
DATA.ts <- ts(BDT2, start = c(2005, 2), frequency = 4)

CV <- DATA.ts[ ,1]
INPC_AB <- DATA.ts[ ,2]
INPC_SERV <- DATA.ts[ ,3]
INPC_T<- DATA.ts[ ,4]
INPC_E <- DATA.ts[ ,5]
IPV <- DATA.ts[ ,6]
IPC_SUB <- DATA.ts[ ,7]
REMESAS <- DATA.ts[ ,8]
INT <- DATA.ts[ ,9]
CONF <- DATA.ts[ ,10]
M1 <- DATA.ts[ ,11]
DEBT <- DATA.ts[ ,12]
EX <- DATA.ts[ ,13]
PIB <- DATA.ts[,14]
DESEMPLEO <- DATA.ts[,15]
IGAE <- DATA.ts[,16]

head(DATA.ts)
```

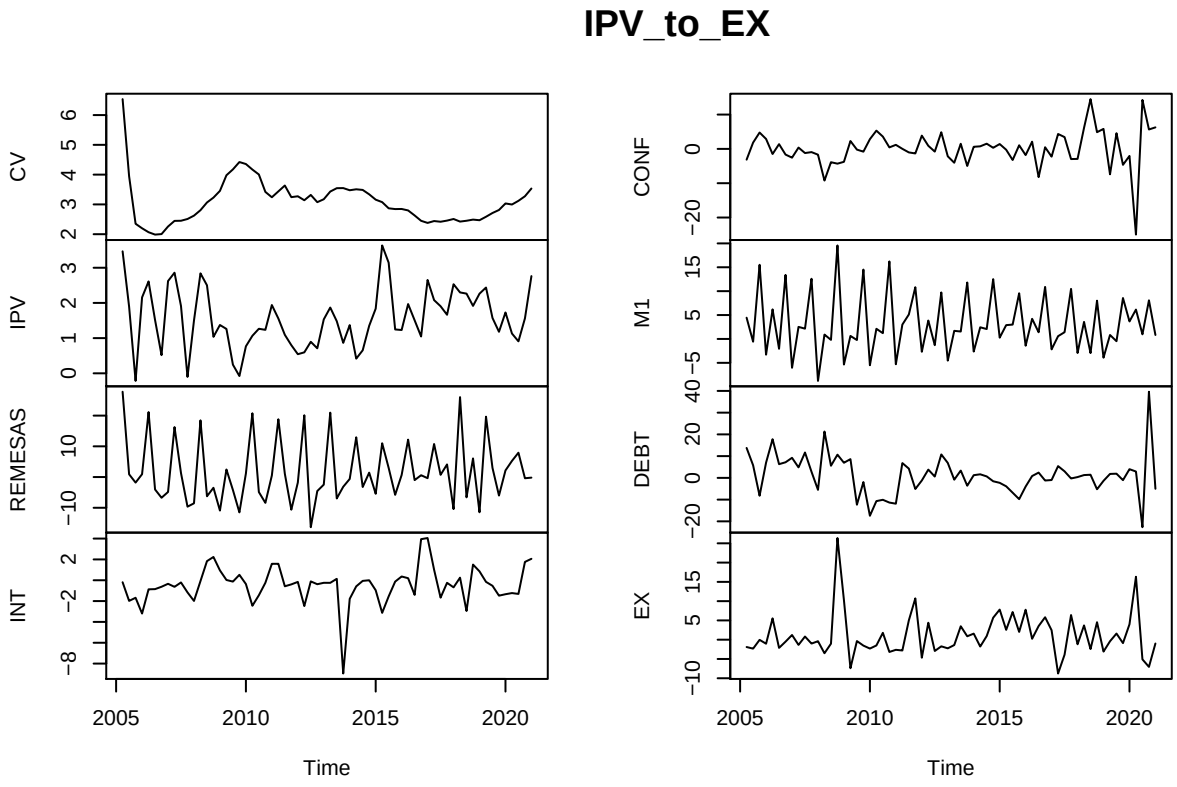
```
##               CV    INPC_AB  INPC_SERV    INPC_T    INPC_E        IPV   IPC_SUB
## 2005 Q2 6.534773  0.7018551 -2.4951237 0.9394907 -6.924964  3.4660615 0.6277530
## 2005 Q3 3.947015  0.8525432  1.0491358 0.4557571  1.906007  1.8943170 0.8263839
## 2005 Q4 2.350651  0.4220444  5.0026781 0.9256332 12.211712 -0.2152642 0.7288090
## 2006 Q1 2.199177  0.5030827  1.0508060 1.2841778  1.429080  2.1572857 0.9439550
## 2006 Q2 2.066763 -0.6987303 -2.1718324 1.2125805 -6.725701  2.6108658 0.7785749
## 2006 Q3 1.986694  5.5345808  0.7797826 0.8662647  1.063017  1.5154350 0.9826554
##            REMESAS        INT      CONF         M1      DEBT          EX
## 2005 Q2 27.7734026 -0.1907032 -3.142433  4.4462848 13.768227 -1.90350962
## 2005 Q3  0.9008468 -1.9823262  1.831598 -0.5757901  5.782404 -2.32225035
## 2005 Q4 -1.8000233 -1.6812865  4.768270 15.5243856 -8.226283 -0.04065695
## 2006 Q1  0.9321390 -3.1970260  2.897367 -3.2951687  7.002603 -1.04508266
## 2006 Q2 21.1573268 -0.8704557 -1.492325  6.1874601 17.777689  5.53210143
## 2006 Q3 -4.0398914 -0.8522727  1.383832 -2.0676441  6.294740 -2.13212457
##               PIB  DESEMPLEO       IGAE
## 2005 Q2  5.616308  -9.525851 -0.1121490
## 2005 Q3 -2.287794   8.693642  1.9744905
## 2005 Q4  3.804774 -17.483354  1.7121746
## 2006 Q1 -1.387925  13.107616  0.7367485
## 2006 Q2  4.200068 -11.208719  1.1990516
## 2006 Q3 -1.800185  27.269522  0.4334371
```

```
# PLOTS
INPC_to_IPC_SUB <- ts(cbind(CV,INPC_AB,INPC_SERV,INPC_T,INPC_E,IPC_SUB),start=c(2005,2),frequency=4)
IPV_to_EX <- ts(cbind(CV, IPV, REMESAS, INT, CONF, M1, DEBT, EX),start=c(2005,2),frequency=4)
```

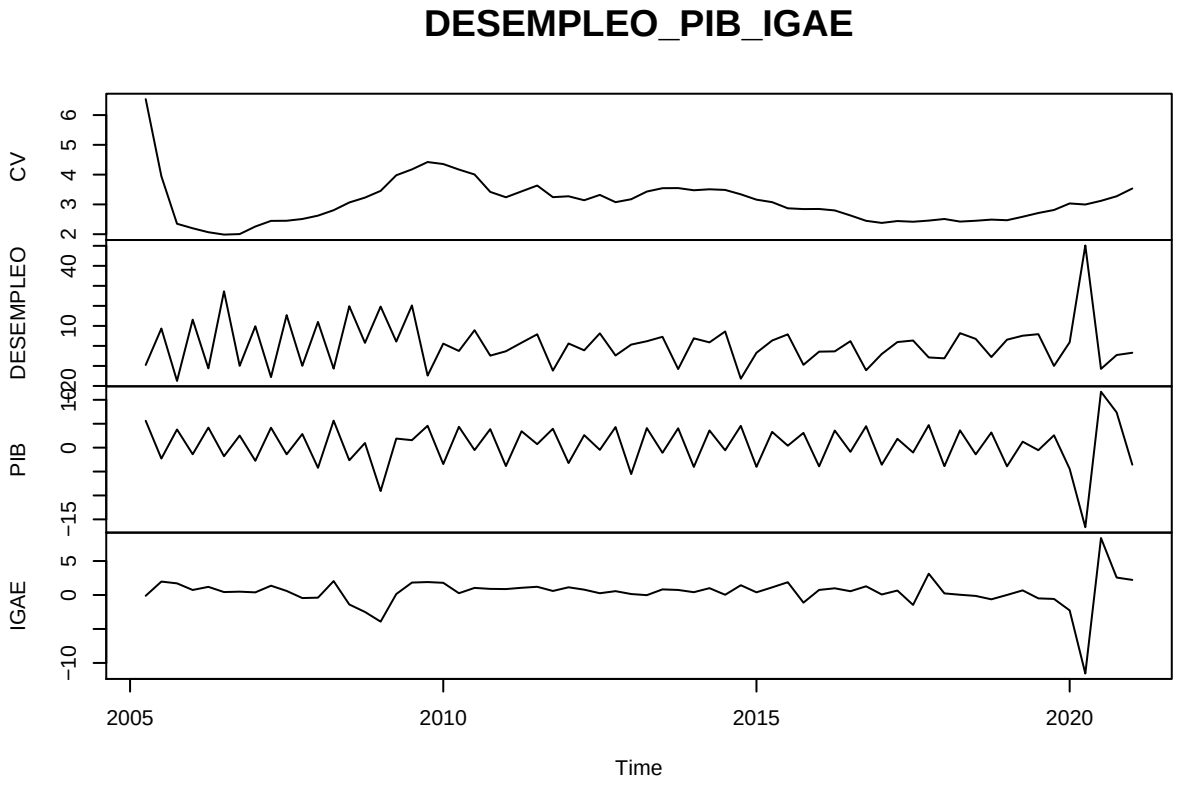
```
DESEMPLEO_PIB_IGAE <- ts(cbind(CV, DESEMPLEO, PIB, IGAE),start=c(2005,2),frequency=4)
plot(INPC_to_IPC_SUB, cex.lab=0.7)
```




```
plot(IPV_to_EX, cex.lab=0.7)
```




```
plot(DESEMPLEO_PIB_IGAE, cex.lab=0.7)
```



1.2 Correlation

```
# Matrix
round(cor(DATA.ts), 2)
```

```
##              CV INPC_AB INPC_SERV INPC_T INPC_E   IPV IPC_SUB REMESAS   INT
## CV         1.00   -0.11     -0.14  -0.01  -0.13 -0.12   -0.17    0.13 -0.04
## INPC_AB   -0.11    1.00      0.41  -0.04   0.35 -0.19    0.40   -0.41  0.06
## INPC_SERV -0.14    0.41      1.00   0.13   0.95 -0.40    0.22   -0.67  0.06
## INPC_T    -0.01   -0.04      0.13   1.00   0.35  0.09    0.44   -0.12  0.16
## INPC_E    -0.13    0.35      0.95   0.35   1.00 -0.35    0.27   -0.67  0.09
## IPV       -0.12   -0.19     -0.40   0.09  -0.35  1.00    0.11    0.38  0.10
## IPC_SUB   -0.17    0.40      0.22   0.44   0.27  0.11    1.00   -0.30  0.35
## REMESAS    0.13   -0.41     -0.67  -0.12  -0.67  0.38   -0.30    1.00 -0.02
## INT       -0.04    0.06      0.06   0.16   0.09  0.10    0.35   -0.02  1.00
## CONF      -0.01   -0.10      0.10   0.11   0.16 -0.07   -0.17   -0.04  0.03
## M1         0.01    0.09      0.50  -0.21   0.45 -0.38   -0.31   -0.02  0.00
## DEBT      -0.11   -0.01     -0.12  -0.27  -0.20  0.25   -0.04    0.17  0.16
## EX        -0.08    0.17      0.18  -0.06   0.14 -0.05    0.10   -0.07  0.09
## PIB        0.10   -0.16      0.12  -0.03   0.10 -0.09   -0.45    0.37 -0.05
## DESEMPLEO -0.03    0.17     -0.34  -0.12  -0.36  0.08    0.17   -0.10 -0.02
## IGAE       0.06   -0.11      0.12   0.23   0.18  0.00   -0.12    0.11 -0.02
##             CONF    M1  DEBT    EX   PIB DESEMPLEO  IGAE
## CV        -0.01  0.01 -0.11 -0.08  0.10     -0.03  0.06
```

```
## INPC_AB   -0.10  0.09 -0.01  0.17 -0.16      0.17 -0.11
## INPC_SERV  0.10  0.50 -0.12  0.18  0.12     -0.34  0.12
## INPC_T     0.11 -0.21 -0.27 -0.06 -0.03     -0.12  0.23
## INPC_E     0.16  0.45 -0.20  0.14  0.10     -0.36  0.18
## IPV       -0.07 -0.38  0.25 -0.05 -0.09      0.08  0.00
## IPC_SUB   -0.17 -0.31 -0.04  0.10 -0.45      0.17 -0.12
## REMESAS   -0.04 -0.02  0.17 -0.07  0.37     -0.10  0.11
## INT        0.03  0.00  0.16  0.09 -0.05     -0.02 -0.02
## CONF       1.00 -0.12 -0.21 -0.45  0.40     -0.35  0.61
## M1        -0.12  1.00  0.06  0.33  0.52     -0.46 -0.01
## DEBT      -0.21  0.06  1.00 -0.03  0.03      0.08 -0.18
## EX        -0.45  0.33 -0.03  1.00 -0.28      0.18 -0.46
## PIB        0.40  0.52  0.03 -0.28  1.00     -0.68  0.67
## DESEMPLEO -0.35 -0.46  0.08  0.18 -0.68      1.00 -0.57
## IGAE       0.61 -0.01 -0.18 -0.46  0.67     -0.57  1.00
```

We filtered the coefficients to only get those greater than 0.5:

```
# Filtered data
cor_mat <- cor(DATA.ts)
cor_mat[!lower.tri(cor_mat)] <- NA # remove diagonal and redundant values
data.frame( cor_mat) %>%
              rownames_to_column() %>%
              gather(key="variable", value="correlation", -rowname) %>%
              filter(abs(correlation) > 0.5)
```

```
##     rowname  variable correlation
## 1    INPC_E INPC_SERV   0.9504520
## 2   REMESAS INPC_SERV  -0.6702286
## 3   REMESAS    INPC_E  -0.6659018
## 4      IGAE      CONF   0.6126806
## 5       PIB        M1   0.5204366
## 6 DESEMPLEO       PIB  -0.6840906
## 7      IGAE       PIB   0.6724641
## 8      IGAE DESEMPLEO  -0.5749911
```

We will have to choose the variables that minimize the AIC further on.

1.3 Stationarity

With a standard dickey fuller test we checked for stationary and for all cases the test-statistic is smaller than the critical value at a 99% confidence level. This means that all variables are stationary. This was expected given that all variables are variations and given the time series graphs analyzed before.

```
CV.DF=ur.df(CV, type="trend",lags=0)
summary(CV.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
```

```
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.32841 -0.18122 -0.02495  0.19757  0.74448
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.843651   0.220195   3.831 0.000307 ***
## z.lag.1     -0.322291   0.060169  -5.356 1.41e-06 ***
## tt           0.003095   0.002426   1.276 0.206945
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3413 on 60 degrees of freedom
## Multiple R-squared:  0.3693, Adjusted R-squared:  0.3483
## F-statistic: 17.57 on 2 and 60 DF,  p-value: 9.857e-07
##
##
## Value of test-statistic is: -5.3564 12.1221 17.5696
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
INPC_AB.DF=ur.df(INPC_AB, type = "trend", lags = 0)
summary(INPC_AB.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.3780 -0.9275  0.1065  0.8337  3.6257
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.815148   0.446123   4.069  0.00014 ***
## z.lag.1     -1.182395   0.126841  -9.322 2.85e-13 ***
## tt          -0.006747   0.011011  -0.613  0.54233
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.588 on 60 degrees of freedom
## Multiple R-squared:  0.5917, Adjusted R-squared:  0.5781
## F-statistic: 43.47 on 2 and 60 DF,  p-value: 2.141e-12
##
##
## Value of test-statistic is: -9.3218 28.9792 43.4687
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
INPC_SERV.DF=ur.df(INPC_SERV, type = "trend", lags = 0)
summary(INPC_SERV.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -4.498 -1.119 -0.122  2.274  4.989
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.944304   0.706587   1.336    0.186
## z.lag.1     -0.996823   0.127556  -7.815 1.01e-10 ***
## tt          -0.003449   0.019023  -0.181    0.857
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.746 on 60 degrees of freedom
## Multiple R-squared:  0.5046, Adjusted R-squared:  0.4881
## F-statistic: 30.56 on 2 and 60 DF,  p-value: 7.039e-10
##
##
## Value of test-statistic is: -7.8148 20.3845 30.5627
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
INPC_T.DF=ur.df(INPC_T, type = "trend", lags = 0)
summary(INPC_T.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.2712 -0.5992 -0.0441  0.3318  6.3139
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.123528   0.381854   2.942  0.00463 **
## z.lag.1     -0.899208   0.129436  -6.947 3.08e-09 ***
## tt           0.000113   0.009357   0.012  0.99040
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.35 on 60 degrees of freedom
## Multiple R-squared:  0.4459, Adjusted R-squared:  0.4275
## F-statistic: 24.14 on 2 and 60 DF,  p-value: 2.028e-08
##
##
## Value of test-statistic is: -6.9471 16.1038 24.1445
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
INPC_E.DF=ur.df(INPC_E, type = "trend", lags = 0)
summary(INPC_E.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.4250  -4.7732   0.0707   5.0357  12.1612
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.518831   1.723935   0.881    0.382
## z.lag.1     -0.973297   0.129757  -7.501 3.49e-10 ***
## tt           0.008326   0.046609   0.179    0.859
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.726 on 60 degrees of freedom
## Multiple R-squared:  0.4839, Adjusted R-squared:  0.4667
## F-statistic: 28.13 on 2 and 60 DF,  p-value: 2.404e-09
##
##
## Value of test-statistic is: -7.5009 18.7968 28.1331
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
IPV.DF=ur.df(IPV, type = "trend", lags = 0)
summary(IPV.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.64677 -0.54579 -0.05738  0.37890  1.93287
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.751867   0.252184   2.981  0.00414 **
## z.lag.1     -0.649245   0.115106  -5.640 4.85e-07 ***
## tt           0.007599   0.005270   1.442  0.15455
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7572 on 60 degrees of freedom
## Multiple R-squared:  0.3523, Adjusted R-squared:  0.3307
```

```
## F-statistic: 16.32 on 2 and 60 DF,  p-value: 2.196e-06
##
##
## Value of test-statistic is: -5.6404 10.8822 16.3165
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
IPC_SUB.DF=ur.df(IPC_SUB, type = "trend", lags = 0)
summary(IPC_SUB.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.56079 -0.19460 -0.01208  0.16223  1.02503
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.7674344  0.1423595   5.391 1.24e-06 ***
## z.lag.1     -0.8179329  0.1280369  -6.388 2.74e-08 ***
## tt          -0.0008094  0.0021107  -0.383    0.703
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3038 on 60 degrees of freedom
## Multiple R-squared:  0.4049, Adjusted R-squared:  0.385
## F-statistic: 20.41 on 2 and 60 DF,  p-value: 1.731e-07
##
##
## Value of test-statistic is: -6.3883 13.6318 20.4091
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
REMESAS.DF=ur.df(REMESAS, type = "trend", lags = 0)
summary(REMESAS.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -13.731  -6.546  -2.088   4.768  20.987
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.19551    2.42641   0.081    0.936
## z.lag.1     -1.25566    0.11717 -10.716 1.46e-15 ***
## tt           0.05333    0.06578   0.811    0.421
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 9.492 on 60 degrees of freedom
## Multiple R-squared:  0.6574, Adjusted R-squared:  0.646
## F-statistic: 57.58 on 2 and 60 DF,  p-value: 1.102e-14
##
##
## Value of test-statistic is: -10.7163 38.4297 57.5757
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
INT.DF=ur.df(INT, type = "trend", lags = 0)
summary(INT.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -8.6971 -0.5969  0.1830  0.5845  4.5021
##
```

```
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.64440    0.45846  -1.406    0.165
## z.lag.1     -0.72530    0.12564  -5.773 2.94e-07 ***
## tt           0.01031    0.01223   0.842    0.403
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.759 on 60 degrees of freedom
## Multiple R-squared:  0.3579, Adjusted R-squared:  0.3365
## F-statistic: 16.72 on 2 and 60 DF,  p-value: 1.69e-06
##
##
## Value of test-statistic is: -5.7726 11.1566 16.7219
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
CONF.DF=ur.df(CONF, type = "trend", lags = 0)
summary(CONF.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -25.8695  -2.1858   0.0963   2.9814  13.9831
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.64097    1.38775  -0.462    0.646
## z.lag.1     -1.02442    0.12994  -7.884 7.74e-11 ***
## tt           0.02469    0.03773   0.655    0.515
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 5.433 on 60 degrees of freedom
## Multiple R-squared:  0.5089, Adjusted R-squared:  0.4925
## F-statistic: 31.08 on 2 and 60 DF,  p-value: 5.446e-10
##
##
## Value of test-statistic is: -7.8836 20.7378 31.0828
##
```

```
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
M1.DF=ur.df(M1, type = "trend", lags = 0)
summary(M1.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -8.508 -3.995 -1.376  3.492 14.631
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  4.911621   1.417883   3.464 0.000988 ***
## z.lag.1     -1.520906   0.110307 -13.788  < 2e-16 ***
## tt          -0.005347   0.037284  -0.143 0.886438
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 5.381 on 60 degrees of freedom
## Multiple R-squared:  0.7601, Adjusted R-squared:  0.7521
## F-statistic: 95.05 on 2 and 60 DF,  p-value: < 2.2e-16
##
##
## Value of test-statistic is: -13.7879 63.3718 95.0541
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
DEBT.DF=ur.df(DEBT, type = "trend", lags = 0)
summary(DEBT.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
```

```
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -21.877  -4.220   0.516   3.734  40.187
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  3.04461    2.38858   1.275    0.207
## z.lag.1     -1.01239    0.12792  -7.914 6.86e-11 ***
## tt          -0.06282    0.06433  -0.977    0.333
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 9.19 on 60 degrees of freedom
## Multiple R-squared:  0.5108, Adjusted R-squared:  0.4945
## F-statistic: 31.33 on 2 and 60 DF,  p-value: 4.823e-10
##
##
## Value of test-statistic is: -7.9144 20.9092 31.3306
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
EX.DF=ur.df(EX, type = "trend", lags = 0)
summary(EX.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -10.165  -3.030  -1.143   2.591  25.596
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.741753   1.433021   0.518    0.607
## z.lag.1     -0.909574   0.128570  -7.075 1.87e-09 ***
## tt           0.008888   0.038962   0.228    0.820
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 5.613 on 60 degrees of freedom
## Multiple R-squared:  0.455,  Adjusted R-squared:  0.4368
## F-statistic: 25.04 on 2 and 60 DF,  p-value: 1.237e-08
##
##
## Value of test-statistic is: -7.0746 16.6965 25.0446
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```
PIB.DF=ur.df(PIB, type="trend",lags=0)
summary(PIB.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -19.109  -1.579   0.345   1.894  12.545
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.07153    0.99482   1.077    0.286
## z.lag.1     -1.47277    0.11319 -13.012   <2e-16 ***
## tt          -0.01174    0.02692  -0.436    0.664
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.882 on 60 degrees of freedom
## Multiple R-squared:  0.7383, Adjusted R-squared:  0.7296
## F-statistic: 84.65 on 2 and 60 DF,  p-value: < 2.2e-16
##
##
## Value of test-statistic is: -13.0117 56.4653 84.6537
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```r
DESEMPLEO.DF=ur.df(DESEMPLEO, type = "trend", lags = 0)
summary(DESEMPLEO.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -16.192  -7.071  -0.982   5.104  50.710
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.33016    2.69020   0.866    0.390
## z.lag.1     -1.40847    0.11690 -12.049   <2e-16 ***
## tt          -0.03506    0.07302  -0.480    0.633
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.54 on 60 degrees of freedom
## Multiple R-squared:  0.7077, Adjusted R-squared:  0.698
## F-statistic: 72.63 on 2 and 60 DF,  p-value: < 2.2e-16
##
##
## Value of test-statistic is: -12.049 48.425 72.6348
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

```r
IGAE.DF=ur.df(IGAE, type = "trend", lags = 0)
summary(IGAE.DF)
```

```
##
## ###############################################
## # Augmented Dickey-Fuller Test Unit Root Test #
## ###############################################
##
## Test regression trend
##
##
## Call:
## lm(formula = z.diff ~ z.lag.1 + 1 + tt)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.9771  -0.3148   0.2031   0.6921   7.1577
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.770689   0.569008   1.354    0.181
## z.lag.1     -1.087418   0.129427  -8.402 1.01e-11 ***
## tt          -0.009125   0.015301  -0.596    0.553
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.2 on 60 degrees of freedom
## Multiple R-squared:  0.5406, Adjusted R-squared:  0.5253
## F-statistic:  35.3 on 2 and 60 DF,  p-value: 7.34e-11
##
##
## Value of test-statistic is: -8.4018 23.5411 35.3027
##
## Critical values for test statistics:
##       1pct  5pct 10pct
## tau3 -4.04 -3.45 -3.15
## phi2  6.50  4.88  4.16
## phi3  8.73  6.49  5.47
```

2 Estimating lags

Given that each variable may have a different lagged effect on the default rate (CV) we perform individual ARIMAs of each stationary variable with CV with different *lags*, to determine which amount of lags gives us the minimum AIC. We do not, however, compute an ARIMA with zero lags, because one would not have the necessary inputs to run the ARIMA and forecast. Thus the comparison below is between: AIC with 1 lags, with 2 lags and with 3 lags.

We chose the right amount of lags for each case, minimizing AIC.

```
# INPC_AB
INPC_AB_v<-as.vector(INPC_AB)
CV_v<-as.vector(CV)
INPC_AB_v2<-cbind(INPC_AB_v,CV_v)
colnames(INPC_AB_v2)<-c("INPC_AB","CV")
a<- lag(INPC_AB_v,0)
x<- lag(INPC_AB_v,1)
y<- lag(INPC_AB_v,2)
z<- lag(INPC_AB_v,3)
INPC_AB_lags <- cbind(x,y,z)

fitINPC_AB1 <- auto.arima(INPC_AB_v2[4: 63,2], xreg=INPC_AB_lags[4: 63,1], d=0)
fitINPC_AB2 <- auto.arima(INPC_AB_v2[4: 63,2], xreg=INPC_AB_lags[4: 63,1:2], d=0)
fitINPC_AB3 <- auto.arima(INPC_AB_v2[4: 63,2], xreg=INPC_AB_lags[4: 63,1:3], d=0)
AIC_INPC_AB <- cbind(fitINPC_AB1$aic,fitINPC_AB2$aic,fitINPC_AB3$aic)
colnames(AIC_INPC_AB)<-c("1 lag","2 lags", "3 lags")
```

```
# INPC_SERV
INPC_SERV_v<-as.vector(INPC_SERV)
CV_v<-as.vector(CV)
INPC_SERV_v2<-cbind(INPC_SERV_v,CV_v)
colnames(INPC_SERV_v2)<-c("INPC_SERV","CV")
a<- lag(INPC_SERV_v,0)
x<- lag(INPC_SERV_v,1)
y<- lag(INPC_SERV_v,2)
z<- lag(INPC_SERV_v,3)
INPC_SERV_lags <- cbind(x,y,z)
fitINPC_SERV1 <- auto.arima(INPC_SERV_v2[4: 63,2], xreg=INPC_SERV_lags[4: 63,1], d=0)
fitINPC_SERV2 <- auto.arima(INPC_SERV_v2[4: 63,2], xreg=INPC_SERV_lags[4: 63,1:2], d=0)
fitINPC_SERV3 <- auto.arima(INPC_SERV_v2[4: 63,2], xreg=INPC_SERV_lags[4: 63,1:3], d=0)
AIC_INPC_SERV <- cbind(fitINPC_SERV1$aic,fitINPC_SERV2$aic,fitINPC_SERV3$aic)
colnames(AIC_INPC_SERV)<-c("1 lag","2 lags", "3 lags")

# INPC_T
INPC_T_v<-as.vector(INPC_T)
CV_v<-as.vector(CV)
INPC_T_v2<-cbind(INPC_T_v,CV_v)
colnames(INPC_T_v2)<-c("INPC_T","CV")
a<- lag(INPC_T_v,0)
x<- lag(INPC_T_v,1)
y<- lag(INPC_T_v,2)
z<- lag(INPC_T_v,3)
INPC_T_lags <- cbind(x,y,z)
fitINPC_T1 <- auto.arima(INPC_T_v2[4: 63,2], xreg=INPC_T_lags[4: 63,1], d=0)
fitINPC_T2 <- auto.arima(INPC_T_v2[4: 63,2], xreg=INPC_T_lags[4: 63,1:2], d=0)
fitINPC_T3 <- auto.arima(INPC_T_v2[4: 63,2], xreg=INPC_T_lags[4: 63,1:3], d=0)
AIC_INPC_T <- cbind(fitINPC_T1$aic,fitINPC_T2$aic,fitINPC_T3$aic)
colnames(AIC_INPC_T)<-c("1 lag","2 lags", "3 lags")

# INPC_E
INPC_E_v<-as.vector(INPC_E)
CV_v<-as.vector(CV)
INPC_E_v2<-cbind(INPC_E_v,CV_v)
colnames(INPC_E_v2)<-c("INPC_E","CV")
a<- lag(INPC_E_v,0)
x<- lag(INPC_E_v,1)
y<- lag(INPC_E_v,2)
z<- lag(INPC_E_v,3)
INPC_E_lags <- cbind(x,y,z)
fitINPC_E1 <- auto.arima(INPC_E_v2[4: 63,2], xreg=INPC_E_lags[4: 63,1], d=0)
fitINPC_E2 <- auto.arima(INPC_E_v2[4: 63,2], xreg=INPC_E_lags[4: 63,1:2], d=0)
fitINPC_E3 <- auto.arima(INPC_E_v2[4: 63,2], xreg=INPC_E_lags[4: 63,1:3], d=0)
AIC_INPC_E <- cbind(fitINPC_E1$aic,fitINPC_E2$aic,fitINPC_E3$aic)
colnames(AIC_INPC_E)<-c("1 lag","2 lags", "3 lags")

# IPV
IPV_v<-as.vector(IPV)
CV_v<-as.vector(CV)
IPV_v2<-cbind(IPV_v,CV_v)
colnames(IPV_v2)<-c("IPV","CV")
```

```
a<- lag(IPV_v,0)
x<- lag(IPV_v,1)
y<- lag(IPV_v,2)
z<- lag(IPV_v,3)
IPV_lags <- cbind(x,y,z)
fitIPV1 <- auto.arima(IPV_v2[4: 63,2], xreg=IPV_lags[4: 63,1], d=0)
fitIPV2 <- auto.arima(IPV_v2[4: 63,2], xreg=IPV_lags[4: 63,1:2], d=0)
fitIPV3 <- auto.arima(IPV_v2[4: 63,2], xreg=IPV_lags[4: 63,1:3], d=0)
AIC_IPV <- cbind(fitIPV1$aic,fitIPV2$aic,fitIPV3$aic)
colnames(AIC_IPV)<-c("1 lag","2 lags", "3 lags")

# IPC_SUB
IPC_SUB_v<-as.vector(IPC_SUB)
CV_v<-as.vector(CV)
IPC_SUB_v2<-cbind(IPC_SUB_v,CV_v)
colnames(IPC_SUB_v2)<-c("IPC_SUB","CV")
a<- lag(IPC_SUB_v,0)
x<- lag(IPC_SUB_v,1)
y<- lag(IPC_SUB_v,2)
z<- lag(IPC_SUB_v,3)
IPC_SUB_lags <- cbind(x,y,z)
fitIPC_SUB1 <- auto.arima(IPC_SUB_v2[4: 63,2], xreg=IPC_SUB_lags[4: 63,1], d=0)
fitIPC_SUB2 <- auto.arima(IPC_SUB_v2[4: 63,2], xreg=IPC_SUB_lags[4: 63,1:2], d=0)
fitIPC_SUB3 <- auto.arima(IPC_SUB_v2[4: 63,2], xreg=IPC_SUB_lags[4: 63,1:3], d=0)
AIC_IPC_SUB <- cbind(fitIPC_SUB1$aic,fitIPC_SUB2$aic,fitIPC_SUB3$aic)
colnames(AIC_IPC_SUB)<-c("1 lag","2 lags", "3 lags")

# REMESAS
REMESAS_v<-as.vector(REMESAS)
CV_v<-as.vector(CV)
REMESAS_v2<-cbind(REMESAS_v,CV_v)
colnames(REMESAS_v2)<-c("REMESAS","CV")
a<- lag(REMESAS_v,0)
x<- lag(REMESAS_v,1)
y<- lag(REMESAS_v,2)
z<- lag(REMESAS_v,3)
REMESAS_lags <- cbind(x,y,z)
fitREMESAS1 <- auto.arima(REMESAS_v2[4: 63,2], xreg=REMESAS_lags[4: 63,1], d=0)
fitREMESAS2 <- auto.arima(REMESAS_v2[4: 63,2], xreg=REMESAS_lags[4: 63,1:2], d=0)
fitREMESAS3 <- auto.arima(REMESAS_v2[4: 63,2], xreg=REMESAS_lags[4: 63,1:3], d=0)
AIC_REMESAS <- cbind(fitREMESAS1$aic,fitREMESAS2$aic,fitREMESAS3$aic)
colnames(AIC_REMESAS)<-c("1 lag","2 lags", "3 lags")

# INT
INT_v<-as.vector(INT)
CV_v<-as.vector(CV)
INT_v2<-cbind(INT_v,CV_v)
colnames(INT_v2)<-c("INT","CV")
a<- lag(INT_v,0)
x<- lag(INT_v,1)
y<- lag(INT_v,2)
z<- lag(INT_v,3)
INT_lags <- cbind(x,y,z)
```

```
fitINT1 <- auto.arima(INT_v2[4: 63,2], xreg=INT_lags[4: 63,1], d=0)
fitINT2 <- auto.arima(INT_v2[4: 63,2], xreg=INT_lags[4: 63,1:2], d=0)
fitINT3 <- auto.arima(INT_v2[4: 63,2], xreg=INT_lags[4: 63,1:3], d=0)
AIC_INT <- cbind(fitINT1$aic,fitINT2$aic,fitINT3$aic)
colnames(AIC_INT)<-c("1 lag","2 lags", "3 lags")

# CONF
CONF_v<-as.vector(CONF)
CV_v<-as.vector(CV)
CONF_v2<-cbind(CONF_v,CV_v)
colnames(CONF_v2)<-c("CONF","CV")
a<- lag(CONF_v,0)
x<- lag(CONF_v,1)
y<- lag(CONF_v,2)
z<- lag(CONF_v,3)
CONF_lags <- cbind(x,y,z)
fitCONF1 <- auto.arima(CONF_v2[4: 63,2], xreg=CONF_lags[4: 63,1], d=0)
fitCONF2 <- auto.arima(CONF_v2[4: 63,2], xreg=CONF_lags[4: 63,1:2], d=0)
fitCONF3 <- auto.arima(CONF_v2[4: 63,2], xreg=CONF_lags[4: 63,1:3], d=0)
AIC_CONF <- cbind(fitCONF1$aic,fitCONF2$aic,fitCONF3$aic)
colnames(AIC_CONF)<-c("1 lag","2 lags", "3 lags")

# M1
M1_v<-as.vector(M1)
CV_v<-as.vector(CV)
M1_v2<-cbind(M1_v,CV_v)
colnames(M1_v2)<-c("M1","CV")
a<- lag(M1_v,0)
x<- lag(M1_v,1)
y<- lag(M1_v,2)
z<- lag(M1_v,3)
M1_lags <- cbind(x,y,z)
fitM11 <- auto.arima(M1_v2[4: 63,2], xreg=M1_lags[4: 63,1], d=0)
fitM12 <- auto.arima(M1_v2[4: 63,2], xreg=M1_lags[4: 63,1:2], d=0)
fitM13 <- auto.arima(M1_v2[4: 63,2], xreg=M1_lags[4: 63,1:3], d=0)
AIC_M1 <- cbind(fitM11$aic,fitM12$aic,fitM13$aic)
colnames(AIC_M1)<-c("1 lag","2 lags", "3 lags")

# DEBT
DEBT_v<-as.vector(DEBT)
CV_v<-as.vector(CV)
DEBT_v2<-cbind(DEBT_v,CV_v)
colnames(DEBT_v2)<-c("DEBT","CV")
a<- lag(DEBT_v,0)
x<- lag(DEBT_v,1)
y<- lag(DEBT_v,2)
z<- lag(DEBT_v,3)
DEBT_lags <- cbind(x,y,z)
fitDEBT1 <- auto.arima(DEBT_v2[4: 63,2], xreg=DEBT_lags[4: 63,1], d=0)
fitDEBT2 <- auto.arima(DEBT_v2[4: 63,2], xreg=DEBT_lags[4: 63,1:2], d=0)
fitDEBT3 <- auto.arima(DEBT_v2[4: 63,2], xreg=DEBT_lags[4: 63,1:3], d=0)
AIC_DEBT <- cbind(fitDEBT1$aic,fitDEBT2$aic,fitDEBT3$aic)
colnames(AIC_DEBT)<-c("1 lag","2 lags", "3 lags")
```

```
# EX
EX_v<-as.vector(EX)
CV_v<-as.vector(CV)
EX_v2<-cbind(EX_v,CV_v)
colnames(EX_v2)<-c("EX","CV")
a<- lag(EX_v,0)
x<- lag(EX_v,1)
y<- lag(EX_v,2)
z<- lag(EX_v,3)
EX_lags <- cbind(x,y,z)
fitEX1 <- auto.arima(EX_v2[4: 63,2], xreg=EX_lags[4: 63,1], d=0)
fitEX2 <- auto.arima(EX_v2[4: 63,2], xreg=EX_lags[4: 63,1:2], d=0)
fitEX3 <- auto.arima(EX_v2[4: 63,2], xreg=EX_lags[4: 63,1:3], d=0)
AIC_EX <- cbind(fitEX1$aic,fitEX2$aic,fitEX3$aic)
colnames(AIC_EX)<-c("1 lag","2 lags", "3 lags")

# PIB
PIB_v<-as.vector(PIB)
CV_v<-as.vector(CV)
PIB_v2<-cbind(PIB_v,CV_v)
colnames(PIB_v2)<-c("PIB","CV")
a<- lag(PIB_v,0)
x<- lag(PIB_v,1)
y<- lag(PIB_v,2)
z<- lag(PIB_v,3)
PIB_lags <- cbind(x,y,z)
fitPIB1 <- auto.arima(PIB_v2[4: 63,2], xreg=PIB_lags[4: 63,1], d=0)
fitPIB2 <- auto.arima(PIB_v2[4: 63,2], xreg=PIB_lags[4: 63,1:2], d=0)
fitPIB3 <- auto.arima(PIB_v2[4: 63,2], xreg=PIB_lags[4: 63,1:3], d=0)
AIC_PIB <- cbind(fitPIB1$aic,fitPIB2$aic,fitPIB3$aic)
colnames(AIC_PIB)<-c("1 lag","2 lags", "3 lags")

# DESEMPLEO
DESEMPLEO_v<-as.vector(DESEMPLEO)
CV_v<-as.vector(CV)
DESEMPLEO_v2<-cbind(DESEMPLEO_v,CV_v)
colnames(DESEMPLEO_v2)<-c("DESEMPLEO","CV")
a<- lag(DESEMPLEO_v,0)
x<- lag(DESEMPLEO_v,1)
y<- lag(DESEMPLEO_v,2)
z<- lag(DESEMPLEO_v,3)
DESEMPLEO_lags <- cbind(x,y,z)
fitDESEMPLEO1 <- auto.arima(DESEMPLEO_v2[4: 63,2], xreg=DESEMPLEO_lags[4: 63,1], d=0)
fitDESEMPLEO2 <- auto.arima(DESEMPLEO_v2[4: 63,2], xreg=DESEMPLEO_lags[4: 63,1:2], d=0)
fitDESEMPLEO3 <- auto.arima(DESEMPLEO_v2[4: 63,2], xreg=DESEMPLEO_lags[4: 63,1:3], d=0)
AIC_DESEMPLEO <- cbind(fitDESEMPLEO1$aic,fitDESEMPLEO2$aic,fitDESEMPLEO3$aic)
colnames(AIC_DESEMPLEO)<-c("1 lag","2 lags", "3 lags")

# IGAE
IGAE_v<-as.vector(IGAE)
CV_v<-as.vector(CV)
IGAE_v2<-cbind(IGAE_v,CV_v)
colnames(IGAE_v2)<-c("IGAE","CV")
```

```
a<- lag(IGAE_v,0)
x<- lag(IGAE_v,1)
y<- lag(IGAE_v,2)
z<- lag(IGAE_v,3)
IGAE_lags <- cbind(x,y,z)
fitIGAE1 <- auto.arima(IGAE_v2[4: 63,2], xreg=IGAE_lags[4: 63,1], d=0)
fitIGAE2 <- auto.arima(IGAE_v2[4: 63,2], xreg=IGAE_lags[4: 63,1:2], d=0)
fitIGAE3 <- auto.arima(IGAE_v2[4: 63,2], xreg=IGAE_lags[4: 63,1:3], d=0)
AIC_IGAE <- cbind(fitIGAE1$aic,fitIGAE2$aic,fitIGAE3$aic)
colnames(AIC_IGAE)<-c("1 lag","2 lags", "3 lags")
```

```
AICs<-rbind(AIC_INPC_AB, AIC_INPC_SERV, AIC_INPC_T, AIC_INPC_E, AIC_IPV, AIC_IPC_SUB, AIC_REMESAS, AIC_
rownames(AICs)<-c("INPC_AB", "INPC_SERV", "INPC_T", "INPC_E", "IPV", "IPC_SUB", "REMESAS", "INT", "CONF
AICs
```

```
##               1 lag    2 lags    3 lags
## INPC_AB   -44.34416 -42.35572 -44.86912
## INPC_SERV -40.94426 -41.47433 -40.05878
## INPC_T    -38.46759 -36.51221 -34.56707
## INPC_E    -40.69909 -40.30348 -38.65377
## IPV       -38.30869 -37.48287 -35.61254
## IPC_SUB   -38.32896 -40.77693 -41.65838
## REMESAS   -42.09516 -40.11344 -44.56620
## INT       -38.31281 -37.70656 -36.44092
## CONF      -38.26051 -36.45590 -37.13657
## M1        -39.03681 -39.52251 -41.54306
## DEBT      -38.28492 -38.46186 -36.58643
## EX        -38.38692 -36.72289 -34.77319
## PIB       -38.43160 -38.84621 -38.07924
## DESEMPLEO -38.46382 -36.65742 -34.66384
## IGAE      -38.38967 -36.41858 -36.61604
```

Analyzing the results above, we created a new excel file (called BDF2) where for each variable we included:

1. The variable with 1 lag
2. The subsequent lagged variables until the minimum AIC is reached

For example, for INPC_AB, the number of lags that minimizes AIC is three. In this case, we include INPC_AB (1 lag), INPC_AB_2 (2 lags) and INPC_AB_3 (3 lags). Like so:

```
BDF2 <- read_excel("BDF NACIONAL LAGS.xlsx")
BDF2 <- ts(BDF2, start = c(2006,1),frequency = 4)
head(BDF2)
```

```
##               CV    INPC_AB  INPC_AB_2  INPC_AB_3  INPC_SERV INPC_SERV_2
## 2006 Q1 2.199177  0.4220444  0.8525432  0.7018551  5.0026781   1.0491358
## 2006 Q2 2.066763  0.5030827  0.4220444  0.8525432  1.0508060   5.0026781
## 2006 Q3 1.986694 -0.6987303  0.5030827  0.4220444 -2.1718324   1.0508060
## 2006 Q4 2.003475  5.5345808 -0.6987303  0.5030827  0.7797826  -2.1718324
## 2007 Q1 2.257972  1.5850926  5.5345808 -0.6987303  3.9809778   0.7797826
## 2007 Q2 2.447487  0.9136926  1.5850926  5.5345808  0.6306750   3.9809778
```

```
##            INPC_T     INPC_E        IPV   IPC_SUB IPC_SUB_2 IPC_SUB_3   REMESAS
## 2006 Q1 0.9256332 12.2117117 -0.2152642 0.7288090 0.8263839 0.6277530 -1.800023
## 2006 Q2 1.2841778  1.4290805  2.1572857 0.9439550 0.7288090 0.8263839  0.932139
## 2006 Q3 1.2125805 -6.7257009  2.6108658 0.7785749 0.9439550 0.7288090 21.157327
## 2006 Q4 0.8662647  1.0630173  1.5154350 0.9826554 0.7785749 0.9439550 -4.039891
## 2007 Q1 0.5247664  9.2075874  0.5160339 0.8913585 0.9826554 0.7785749 -6.732341
## 2007 Q2 1.1675579  0.4696561  2.6219289 1.1435721 0.8913585 0.9826554 -4.853932
##          REMESAS_2  REMESAS_3        INT      CONF        M1       M1_2
## 2006 Q1  0.9008468 27.7734026 -1.6812865  4.768270 15.524386 -0.5757901
## 2006 Q2 -1.8000233  0.9008468 -3.1970260  2.897367 -3.295169 15.5243856
## 2006 Q3  0.9321390 -1.8000233 -0.8704557 -1.492325  6.187460 -3.2951687
## 2006 Q4 21.1573268  0.9321390 -0.8522727  1.383832 -2.067644  6.1874601
## 2007 Q1 -4.0398914 21.1573268 -0.6251628 -1.650998 13.407490 -2.0676441
## 2007 Q2 -6.7323410 -4.0398914 -0.3407602 -2.555097 -6.039887 13.4074901
##               M1_3      DEBT    DEBT_2       PIB     PIB_2  DESEMPLEO      IGAE
## 2006 Q1  4.4462848 -8.226283  5.782404  3.804774 -2.287794 -17.483354 1.7121746
## 2006 Q2 -0.5757901  7.002603 -8.226283 -1.387925  3.804774  13.107616 0.7367485
## 2006 Q3 15.5243856 17.777689  7.002603  4.200068 -1.387925 -11.208719 1.1990516
## 2006 Q4 -3.2951687  6.294740 17.777689 -1.800185  4.200068  27.269522 0.4334371
## 2007 Q1  6.1874601  7.173895  6.294740  2.528630 -1.800185  -9.953840 0.4903945
## 2007 Q2 -2.0676441  9.223489  7.173895 -2.750982  2.528630   9.819431 0.3878567
##                 EX
## 2006 Q1 -0.04065695
## 2006 Q2 -1.04508266
## 2006 Q3  5.53210143
## 2006 Q4 -2.13212457
## 2007 Q1 -0.51285299
## 2007 Q2  1.21731087
```

3 Models & hypothesis

Now, with all variables stationary and with the right amount of lags, we test *different combinations of variables*, to remove those that do not contribute to the minimization of AIC. (Note that the significance of the coefficients is not very relevant for the forecast model and for the scope of this investigation)

We did this in accordance to the next hypothesis and in line with what literature in similar studies has done:

3.1 Hypothesis

3.1.1 Borrower's ability to pay

(explain)

3.1.2 Willingness of consumers to pay their mortgage

(explain)

3.1.3 Confidence and cost indicators for home purchase

(explain)

```
training_set<-ts(BDF2[1:59,],start = c(2006,1),frequency=4)
```

3.2 Testing models

H1 23:24 PIB 26: IGAE

H2 2:7 INPC_AB a T 8: INPC_E 10:12 IPC_SUB

CONSTANT 13:15 REMESAS 9: IPV 25: DESEMPLEO

VARIABLE 18:20 M1 17: CONF 27: EX 21:22 DEBT 16: INT

Model 1: 25,13:15,9, 23:24, 2:7 + variable Model 2: 25,13:15,9, 23:24, 8,10:12 + variable Model 3: 25,13:15,9, 26, 2:7 + variable Model 4: 25,13:15,9, 26, 8,10:12 + variable

```
# Modelo 1
modelo_1.1 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 27, 21:22, 16)])
modelo_1.2 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 27, 21:22)])
modelo_1.3 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 27, 16)])
modelo_1.4 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 27)])
modelo_1.5 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 21:22, 16)])
modelo_1.6 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 21:22)])
modelo_1.7 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17, 16)])
modelo_1.8 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 17)])
modelo_1.9 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 27, 21:22, 16)])
modelo_1.10 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 27, 21:22)])
modelo_1.11 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 27, 16)])
modelo_1.12 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 27)])
modelo_1.13 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 21:22, 16)])
modelo_1.14 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 21:22)])
modelo_1.15 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20, 16)])
modelo_1.16 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 18:20)])
modelo_1.17 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 27, 21:22, 16)])
modelo_1.18 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 27, 21:22)])
modelo_1.19 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 27, 16)])
```

```
modelo_1.20 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 27)])
modelo_1.21 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 21:22, 16)])
modelo_1.22 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 21:22)])
modelo_1.23 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17, 16)])
modelo_1.24 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 17)])
modelo_1.25 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 27, 21:22, 16)])
modelo_1.26 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 27, 21:22)])
modelo_1.27 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 27, 16)])
modelo_1.28 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 27)])
modelo_1.29 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 21:22, 16)])
modelo_1.30 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 21:22)])
modelo_1.31 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7, 16)])
modelo_1.32 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  2:7)])
```

```
# Modelo 2
modelo_2.1 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 27, 21:22, 16)])
modelo_2.2 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 27, 21:22)])
modelo_2.3 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 27, 16)])
modelo_2.4 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 27)])
modelo_2.5 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 21:22, 16)])
modelo_2.6 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 21:22)])
modelo_2.7 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17, 16)])
modelo_2.8 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17)])
modelo_2.9 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 27, 21:22, 16)])
modelo_2.10 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 27, 21:22)])
modelo_2.11 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 27, 16)])
modelo_2.12 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 27)])
modelo_2.13 <- auto.arima(training_set[,"CV"],
```

```
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 21:22, 16)])
modelo_2.14 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 21:22)])
modelo_2.15 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 16)])
modelo_2.16 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 18:20)])
modelo_2.17 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 27, 21:22, 16)])
modelo_2.18 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 27, 21:22)])
modelo_2.19 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 27, 16)])
modelo_2.20 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 27)])
modelo_2.21 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 21:22, 16)])
modelo_2.22 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 21:22)])
modelo_2.23 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17, 16)])
modelo_2.24 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 17)])
modelo_2.25 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 27, 21:22, 16)])
modelo_2.26 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 27, 21:22)])
modelo_2.27 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 27, 16)])
modelo_2.28 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 27)])
modelo_2.29 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 21:22, 16)])
modelo_2.30 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 21:22)])
modelo_2.31 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12, 16)])
modelo_2.32 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 23:24,  8, 10:12)])
```

```
# Modelo 3
modelo_3.1 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 27, 21:22, 16)])
modelo_3.2 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 27, 21:22)])
modelo_3.3 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 27, 16)])
modelo_3.4 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 27)])
modelo_3.5 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 21:22, 16)])
modelo_3.6 <- auto.arima(training_set[,"CV"],
                        xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 21:22)])
```

```
modelo_3.7 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17, 16)])
modelo_3.8 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 17)])
modelo_3.9 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 27, 21:22, 16)])
modelo_3.10 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 27, 21:22)])
modelo_3.11 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 27, 16)])
modelo_3.12 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 27)])
modelo_3.13 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 21:22, 16)])
modelo_3.14 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 21:22)])
modelo_3.15 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20, 16)])
modelo_3.16 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 18:20)])
modelo_3.17 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 27, 21:22, 16)])
modelo_3.18 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 27, 21:22)])
modelo_3.19 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 27, 16)])
modelo_3.20 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 27)])
modelo_3.21 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 21:22, 16)])
modelo_3.22 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 21:22)])
modelo_3.23 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17, 16)])
modelo_3.24 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 17)])
modelo_3.25 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 27, 21:22, 16)])
modelo_3.26 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 27, 21:22)])
modelo_3.27 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 27, 16)])
modelo_3.28 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 27)])
modelo_3.29 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 21:22, 16)])
modelo_3.30 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 21:22)])
modelo_3.31 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7, 16)])
modelo_3.32 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  2:7)])
```

```r
# Modelo 4
modelo_4.1 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 27, 21:22, 16)])
modelo_4.2 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 27, 21:22)])
modelo_4.3 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 27, 16)])
modelo_4.4 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 27)])
modelo_4.5 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 21:22, 16)])
modelo_4.6 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 21:22)])
modelo_4.7 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17, 16)])
modelo_4.8 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 17)])
modelo_4.9 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 27, 21:22, 16)])
modelo_4.10 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 27, 21:22)])
modelo_4.11 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 27, 16)])
modelo_4.12 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 27)])
modelo_4.13 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 21:22, 16)])
modelo_4.14 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 21:22)])
modelo_4.15 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20, 16)])
modelo_4.16 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 18:20)])
modelo_4.17 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 27, 21:22, 16)])
modelo_4.18 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 27, 21:22)])
modelo_4.19 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 27, 16)])
modelo_4.20 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 27)])
modelo_4.21 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 21:22, 16)])
modelo_4.22 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 21:22)])
modelo_4.23 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17, 16)])
modelo_4.24 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 17)])
modelo_4.25 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 27, 21:22, 16)])
modelo_4.26 <- auto.arima(training_set[,"CV"],
                         xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 27, 21:22)])
```

```
modelo_4.27 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 27, 16)])
modelo_4.28 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 27)])
modelo_4.29 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 21:22, 16)])
modelo_4.30 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 21:22)])
modelo_4.31 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12, 16)])
modelo_4.32 <- auto.arima(training_set[,"CV"],
                          xreg=training_set[,c(25,13:15,9, 26,  8, 10:12)])
```

```
#AIC comparison
AICs_modelo1<-rbind(modelo_1.1$aic,modelo_1.2$aic,modelo_1.3$aic,modelo_1.4$aic,modelo_1.5$aic,modelo_1

AICs_modelo2<-rbind(modelo_2.1$aic,modelo_2.2$aic,modelo_2.3$aic,modelo_2.4$aic,modelo_2.5$aic,modelo_2

AICs_modelo3<-rbind(modelo_3.1$aic,modelo_3.2$aic,modelo_3.3$aic,modelo_3.4$aic,modelo_3.5$aic,modelo_3

AICs_modelo4<-rbind(modelo_4.1$aic,modelo_4.2$aic,modelo_4.3$aic,modelo_4.4$aic,modelo_4.5$aic,modelo_4

AICs_modelos<-cbind(AICs_modelo1,AICs_modelo2,AICs_modelo3,AICs_modelo4)
colnames(AICs_modelos)<-c("Modelo 1","Modelo 2", "Modelo 3", "Modelo 4")
rownames(AICs_modelos)<-c(1:32)

AICs_modelos
```

```
##     Modelo 1  Modelo 2  Modelo 3  Modelo 4
## 1  -51.96869 -52.24401 -53.48009 -50.32843
## 2  -53.44749 -53.98491 -54.67169 -51.09328
## 3  -51.14264 -55.47369 -51.47582 -53.21826
## 4  -53.11779 -62.52516 -52.15267 -54.05153
## 5  -53.96401 -54.18569 -55.44268 -52.02117
## 6  -55.43987 -55.97857 -56.62793 -53.08792
## 7  -53.05939 -57.45682 -53.46903 -54.31888
## 8  -55.02509 -64.52464 -54.14089 -55.80039
## 9  -53.52958 -49.57884 -55.22575 -50.50375
## 10 -54.78758 -51.55611 -56.34255 -51.43826
## 11 -51.44055 -51.01616 -53.27547 -53.13651
## 12 -52.33953 -53.00788 -53.79828 -54.16871
## 13 -55.52177 -51.26437 -57.18496 -51.93698
## 14 -56.77317 -53.26157 -58.29190 -53.32625
## 15 -53.41645 -52.39010 -55.27188 -53.63091
## 16 -54.33953 -54.17703 -55.77074 -55.41949
## 17 -50.49885 -49.47908 -52.71045 -52.11599
## 18 -52.16573 -51.46601 -54.38267 -53.86981
## 19 -51.12127 -53.75376 -49.82791 -53.02352
## 20 -53.10632 -55.59215 -52.91542 -54.96211
## 21 -51.83870 -50.97404 -53.03099 -52.86733
## 22 -53.26559 -52.97155 -54.59639 -54.84813
## 23 -52.92567 -52.30242 -51.04859 -54.76216
## 24 -54.91320 -54.13034 -54.67138 -56.75296
```

```
## 25 -52.43449 -50.94898 -54.66645 -48.49475
## 26 -54.14197 -52.91952 -56.36576 -50.32948
## 27 -50.50777 -51.63444 -51.74564 -51.91421
## 28 -52.86948 -53.36676 -52.38744 -53.91220
## 29 -53.74425 -52.63237 -54.84771 -50.27650
## 30 -55.19472 -54.63172 -56.45737 -51.84772
## 31 -52.06149 -53.63353 -52.89826 -53.85234
## 32 -54.84836 -55.32332 -53.68042 -55.85044
```

3.3 Best model

```
min(AICs_modelos)
```

```
## [1] -64.52464
```

3.4 Testing model_2.8 with "Ljuan-Box"

White noise test, model validation (must be greater than 0.5 to be good) (mean equal to zero, constant variance and no significant correlation

```
Box.test(residuals(modelo_2.8), type = "Ljung-Box")
```

```
##
##  Box-Ljung test
##
## data:  residuals(modelo_2.8)
## X-squared = 0.052166, df = 1, p-value = 0.8193
```

The model with the lowest AIC is **model_2.8** with AIC = -64.52464 and a Ljuan-Box p-value > 0.5. This model includes:

1. Borrower's ability to pay: (A) PIB instead of IGAE and (B) Unemployment and Remittances.
2. Willingness of consumers to pay their mortgage: (A) INPC_E and IPC_SUB instead of the disaggregated INPC and (B) M1.
3. Confidence and cost indicators for home purchase: IPV and consumer's confidence (CONF).

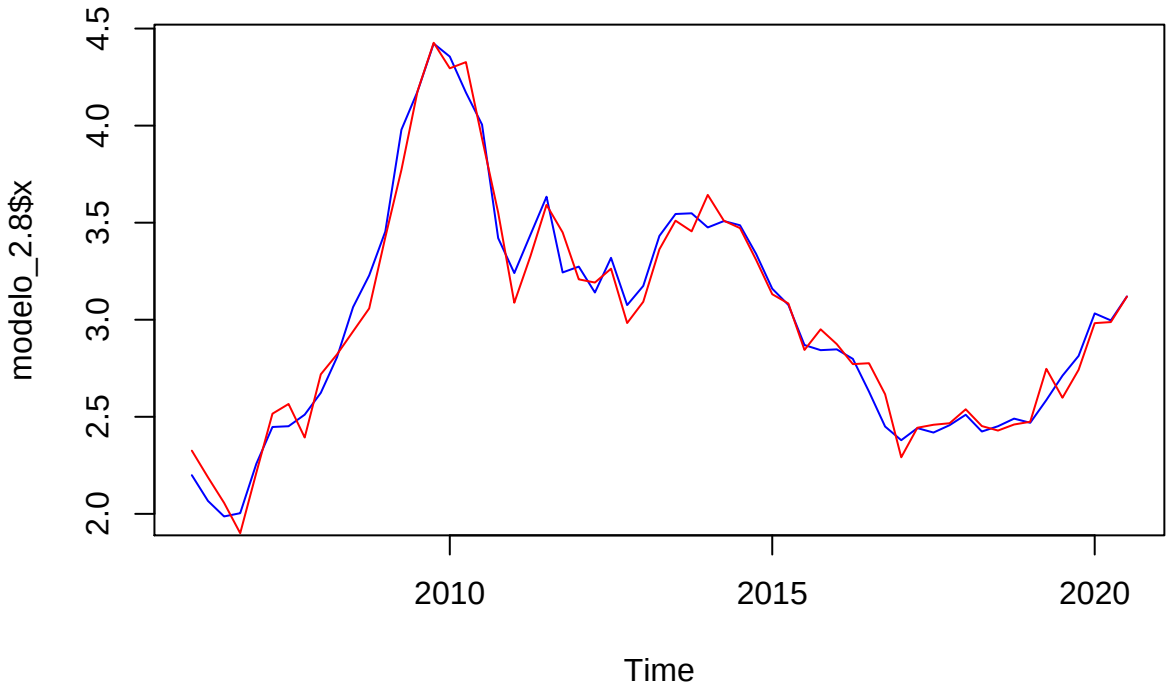
The selected model is an ARIMA(2,0,3):

```
summary(modelo_2.8)
```

```
## Series: training_set[, "CV"]
## Regression with ARIMA(3,0,2) errors
##
## Coefficients:
##          ar1     ar2      ar3     ma1     ma2  intercept  DESEMPLEO  REMESAS
##       0.7214  0.6970  -0.5555  0.8796  0.4913     2.7034    -0.0014  -0.0003
## s.e.  0.2003  0.1619   0.1593  0.3230  0.2418     0.2424     0.0017   0.0019
##       REMESAS_2  REMESAS_3      IPV     PIB   PIB_2  INPC_E  IPC_SUB  IPC_SUB_2
##         -0.0023    -0.0094  -0.0913  0.0238  0.0066  0.0086   0.1134     0.1635
```

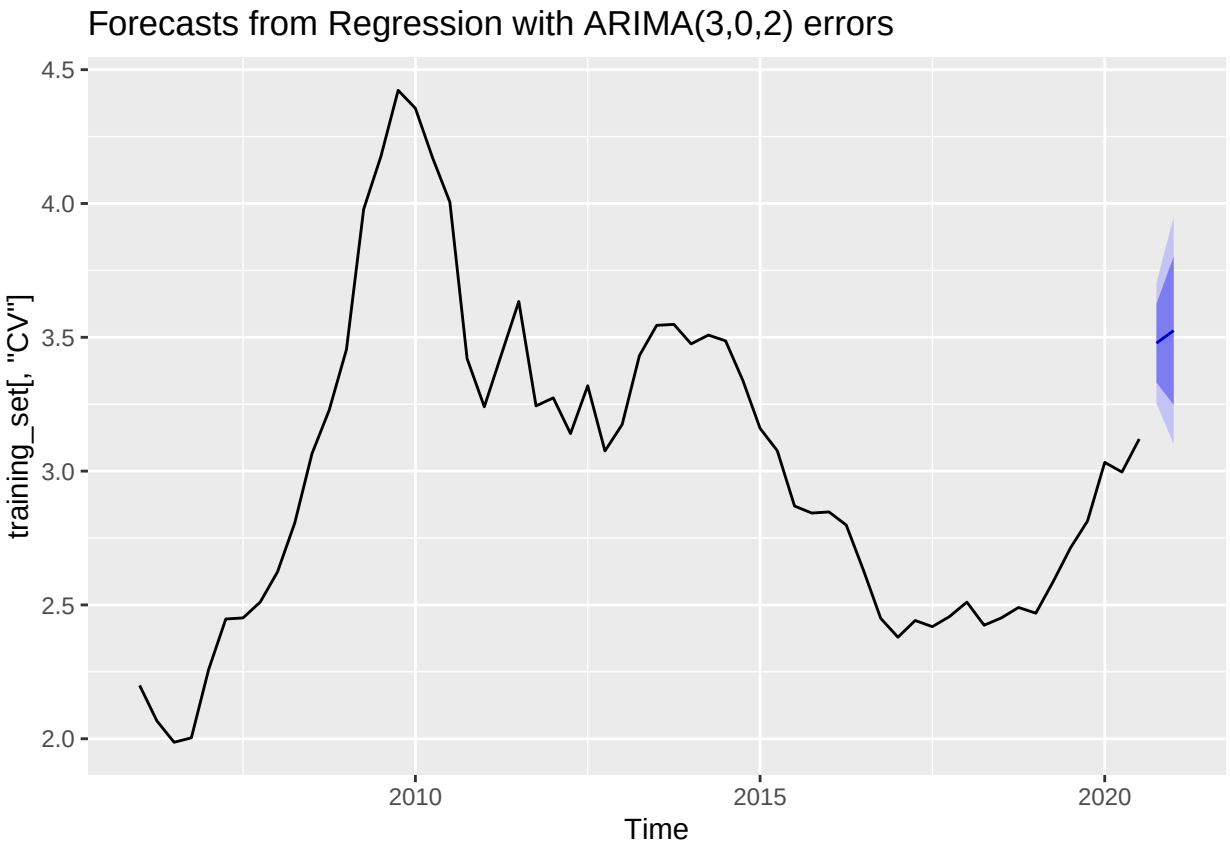
```
## s.e.     0.0017     0.0016   0.0222  0.0077  0.0082  0.0025   0.0723     0.0554
##       IPC_SUB_3       M1    M1_2    M1_3     CONF
##          0.2120  -0.0057  0.0042  0.0068  -0.0097
## s.e.     0.0573   0.0040  0.0044  0.0052   0.0027
##
## sigma^2 estimated as 0.01315:  log likelihood=54.26
## AIC=-64.52   AICc=-36.41   BIC=-18.82
##
## Training set error measures:
##                       ME       RMSE        MAE         MPE     MAPE      MASE
## Training set 0.00301571 0.09204153 0.07288061 -0.04339445 2.518327 0.1864579
##                      ACF1
## Training set -0.02899452
```

```
plot(modelo_2.8$x,col="blue")
lines(fitted(modelo_2.8),col="red")
```



Forecast for last 2 quarters:

```
test_set1<-as.matrix(BDF2[60:61,c(25,13:15,9, 23:24,  8, 10:12, 18:20, 17)])
test_set<-t(test_set1)

library("forecast")
forecast_cv<-forecast(modelo_2.8,xreg=test_set1)
autoplot(forecast_cv)
```




```
forecast_cv
```

```
##         Point Forecast    Lo 80    Hi 80    Lo 95    Hi 95
## 2020 Q4       3.478257 3.331278 3.625235 3.253472 3.703041
## 2021 Q1       3.524858 3.247420 3.802296 3.100553 3.949163
```

```
forecast_2<-c("3.478257","3.524858")
comparison<-as.data.frame(cbind(tail(DATA.ts[63:64,"CV"]),forecast_2))
colnames(comparison)<-c("Actual CV","Forecasted CV")
rownames(comparison)<-c("2020 Q4","2021 Q1")
comparison
```

```
##                Actual CV Forecasted CV
## 2020 Q4 3.27408756441129      3.478257
## 2021 Q1 3.53406391042347      3.524858
```

3.5 Data Analysis

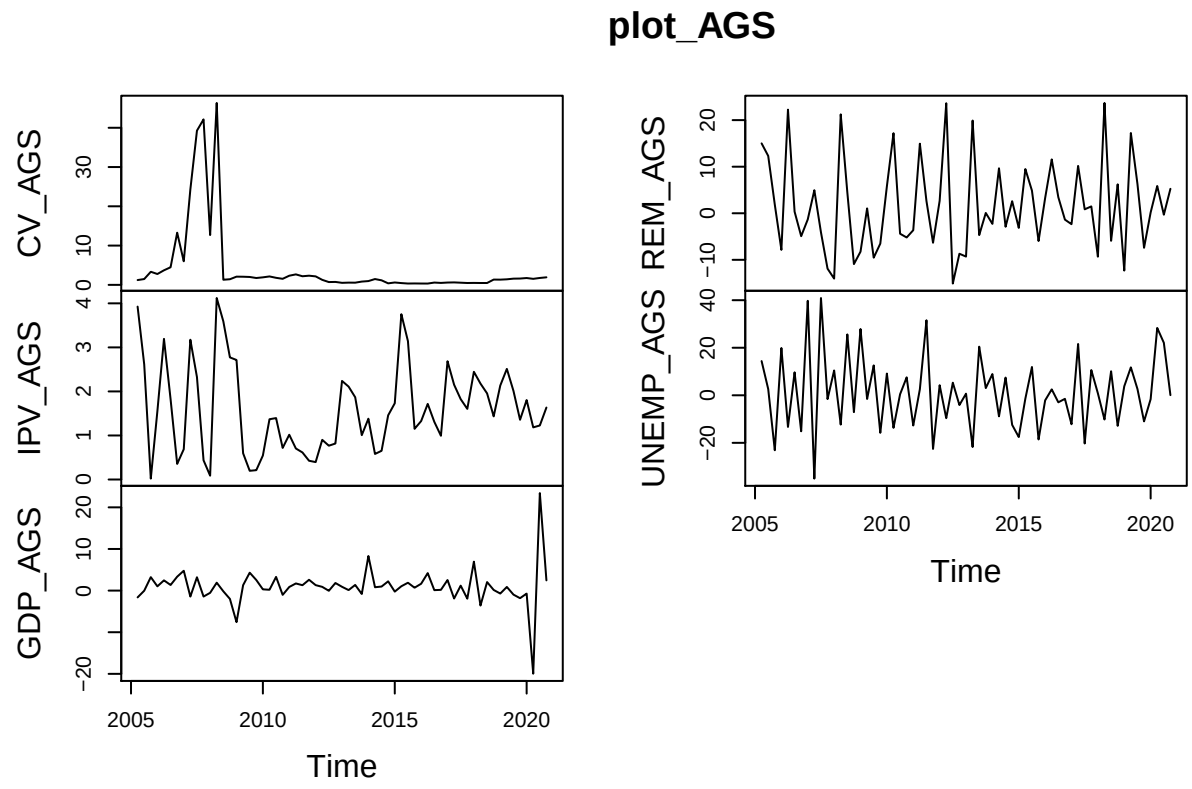
```
# (por poner, HTML format)
```

4 State Data Set

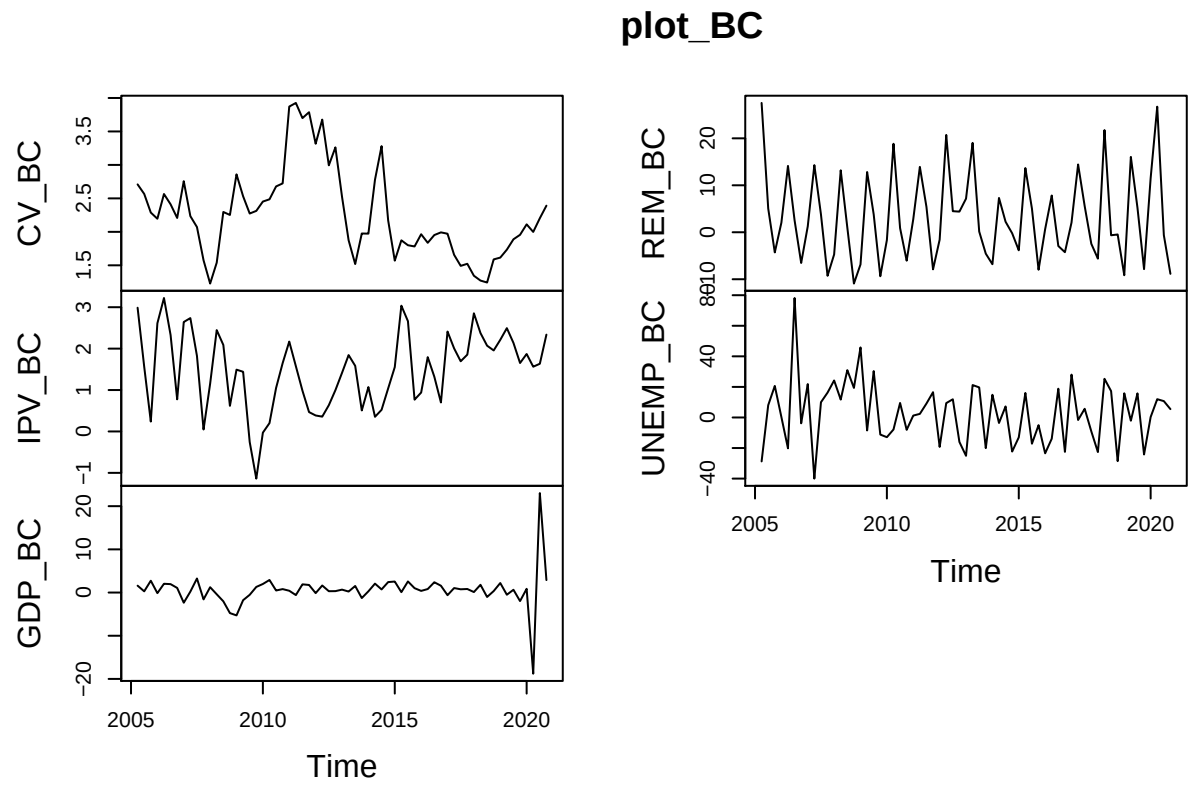
Now we intend to follow a very similar methodology for the state level data.

4.1 Loading and visualizing the data: 32 states

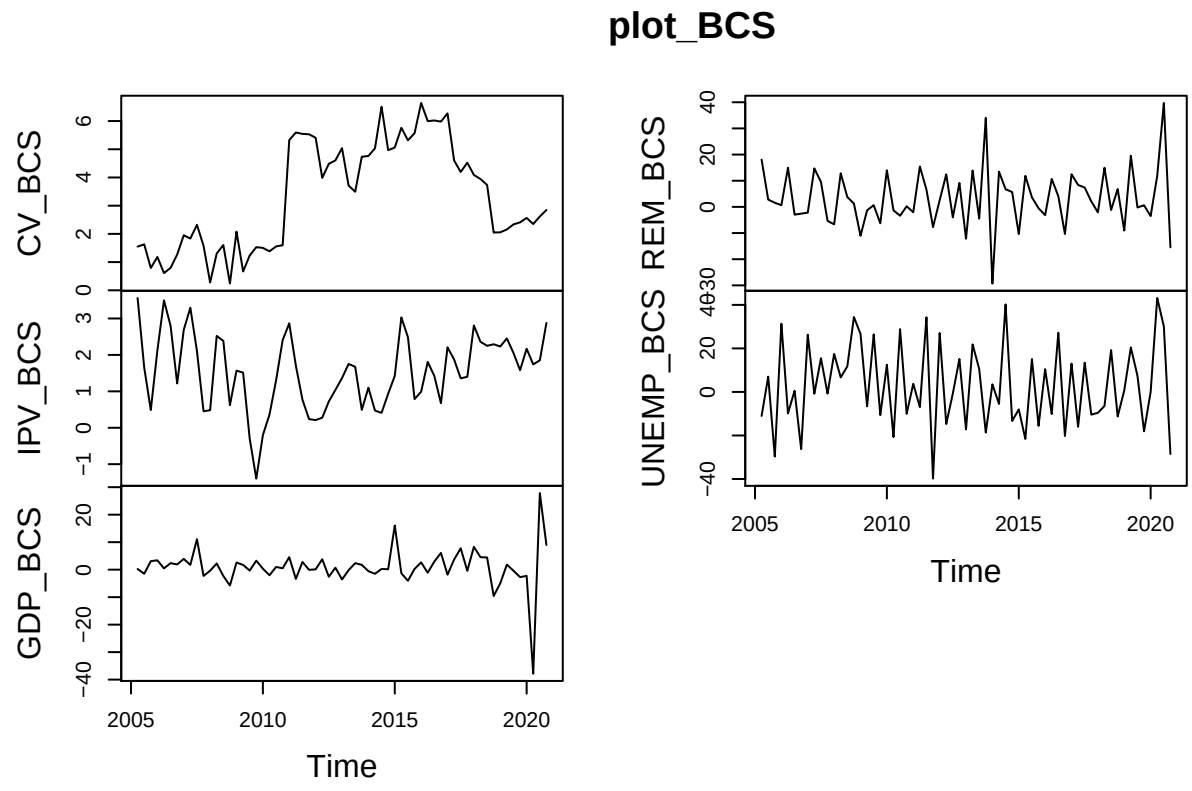
```
AGS<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 1)), start=c(2005,2), end=c(2020,4),  frequency=4)
BC<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 2)), start=c(2005,2), end=c(2020,4),   frequency=4)
BCS<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 3)), start=c(2005,2), end=c(2020,4),   frequency=4)
CAMP<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 4)), start=c(2005,2), end=c(2020,4),   frequency=4)
CDMX<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 5)), start=c(2005,2), end=c(2020,4),   frequency=4)
CHIH<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 6)), start=c(2005,2), end=c(2020,4),   frequency=4)
CHIS<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 7)), start=c(2005,2), end=c(2020,4),   frequency=4)
COAH<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 8)), start=c(2005,2), end=c(2020,4),   frequency=4)
COL<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 9)), start=c(2005,2), end=c(2020,4),   frequency=4)
DGO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 10)), start=c(2005,2), end=c(2020,4),   frequency=4)
GRO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 11)), start=c(2005,2), end=c(2020,4),   frequency=4)
GTO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 12)), start=c(2005,2), end=c(2020,4),   frequency=4)
HGO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 13)), start=c(2005,2), end=c(2020,4),   frequency=4)
JAL<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 14)), start=c(2005,2), end=c(2020,4),   frequency=4)
MEX<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 15)), start=c(2005,2), end=c(2020,4),   frequency=4)
MICH<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 16)), start=c(2005,2), end=c(2020,4),   frequency=4)
MOR<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 17)), start=c(2005,2), end=c(2020,4),   frequency=4)
NAY<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 18)), start=c(2005,2), end=c(2020,4),   frequency=4)
NL<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 19)), start=c(2005,2),  end=c(2020,4),  frequency=4)
OAXACA<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 20)), start=c(2005,2), end=c(2020,4),   frequency=4)
PUE<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 21)), start=c(2005,2), end=c(2020,4),   frequency=4)
Q_ROO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 22)), start=c(2005,2), end=c(2020,4),   frequency=4)
QRO<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 23)), start=c(2005,2), end=c(2020,4),   frequency=4)
SIN<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 24)), start=c(2005,2), end=c(2020,4),   frequency=4)
SLP<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 25)), start=c(2005,2), end=c(2020,4),   frequency=4)
SON<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 26)), start=c(2005,2), end=c(2020,4),   frequency=4)
TAB<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 27)), start=c(2005,2), end=c(2020,4),   frequency=4)
TAMPS<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 28)), start=c(2005,2), end=c(2020,4),   frequency=4)
TLAX<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 29)), start=c(2005,2), end=c(2020,4),   frequency=4)
VER<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 30)), start=c(2005,2), end=c(2020,4),   frequency=4)
YUC<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 31)), start=c(2005,2), end=c(2020,4),   frequency=4)
ZAC<-ts(data=(read_excel("ESTADOS.xlsx", sheet = 32)), start=c(2005,2), end=c(2020,4),   frequency=4)

CV_AGS <- AGS[ ,1]
IPV_AGS <- AGS[ ,2]
GDP_AGS <- AGS[,5]
REM_AGS <- AGS[,4]
UNEMP_AGS <- AGS[,3]
INPC_SUB_AGS <- AGS[,6]
INPC_E_AGS <- AGS[,7]
M1_AGS <- AGS[,8]
CONF_AGS <- AGS[,9]

plot_AGS<-ts(cbind(CV_AGS,IPV_AGS,GDP_AGS,REM_AGS,UNEMP_AGS),start=c(2005,2),frequency=4)
plot(plot_AGS)
```



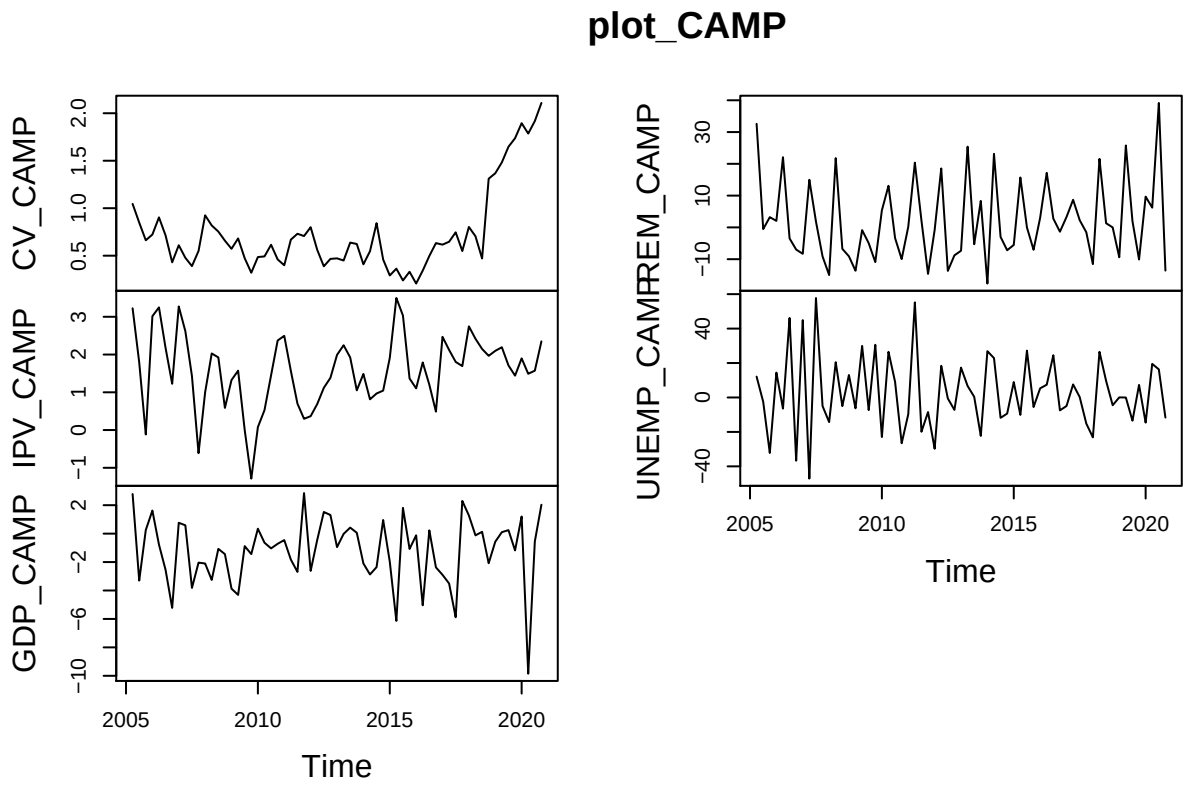

```
CV_BC <- BC[ ,1]
IPV_BC <- BC[ ,2]
GDP_BC <- BC[,5]
REM_BC <- BC[,4]
UNEMP_BC <- BC[,3]
INPC_SUB_BC<- BC[,6]
INPC_E_BC <- BC[,7]
M1_BC <- BC[,8]
CONF_BC <- BC[,9]
plot_BC<-ts(cbind(CV_BC,IPV_BC,GDP_BC,REM_BC,UNEMP_BC),start=c(2005,2),frequency=4)
plot(plot_BC)
```



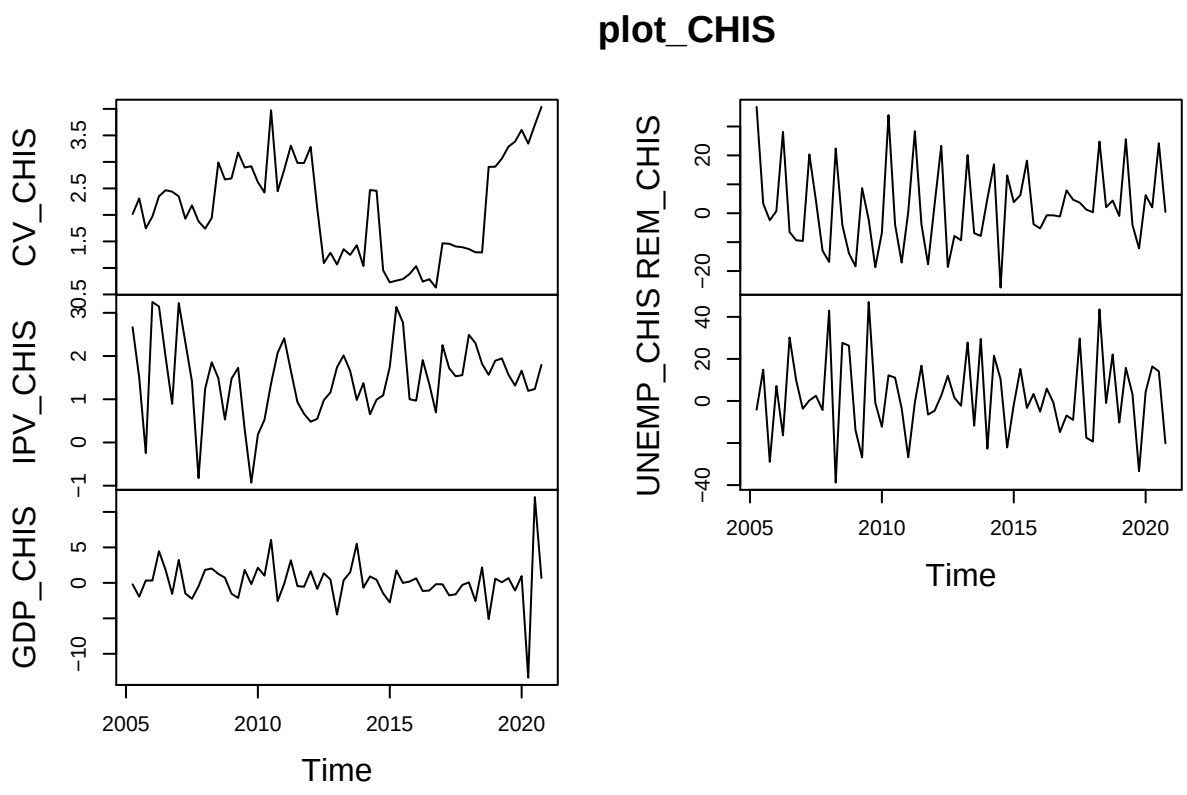

```
CV_BCS <- BCS[ ,1]
IPV_BCS <- BCS[ ,2]
GDP_BCS <- BCS[,5]
REM_BCS <- BCS[,4]
UNEMP_BCS <- BCS[,3]
INPC_SUB_BCS <- BCS[,6]
INPC_E_BCS <- BCS[,7]
M1_BCS <- BCS[,8]
CONF_BCS <- BCS[,9]
plot_BCS<-ts(cbind(CV_BCS,IPV_BCS,GDP_BCS,REM_BCS,UNEMP_BCS),start=c(2005,2),frequency=4)
plot(plot_BCS)
```



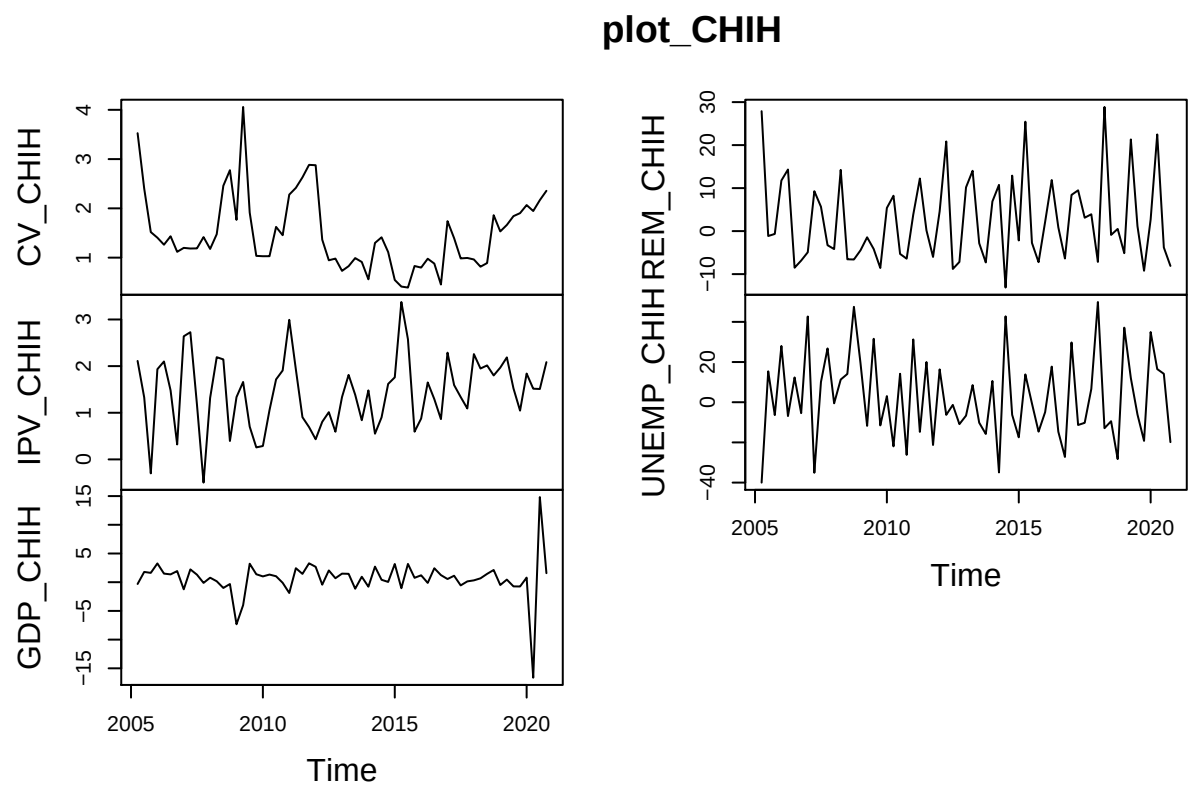

```
CV_CAMP <- CAMP[ ,1]
IPV_CAMP <- CAMP[ ,2]
GDP_CAMP <- CAMP[,5]
REM_CAMP <- CAMP[,4]
UNEMP_CAMP <- CAMP[,3]
INPC_SUB_CAMP <- CAMP[,6]
INPC_E_CAMP <- CAMP[,7]
M1_CAMP <- CAMP[,8]
CONF_CAMP <- CAMP[,9]
plot_CAMP<-ts(cbind(CV_CAMP,IPV_CAMP,GDP_CAMP,REM_CAMP,UNEMP_CAMP),start=c(2005,2),frequency=4)
plot(plot_CAMP)
```



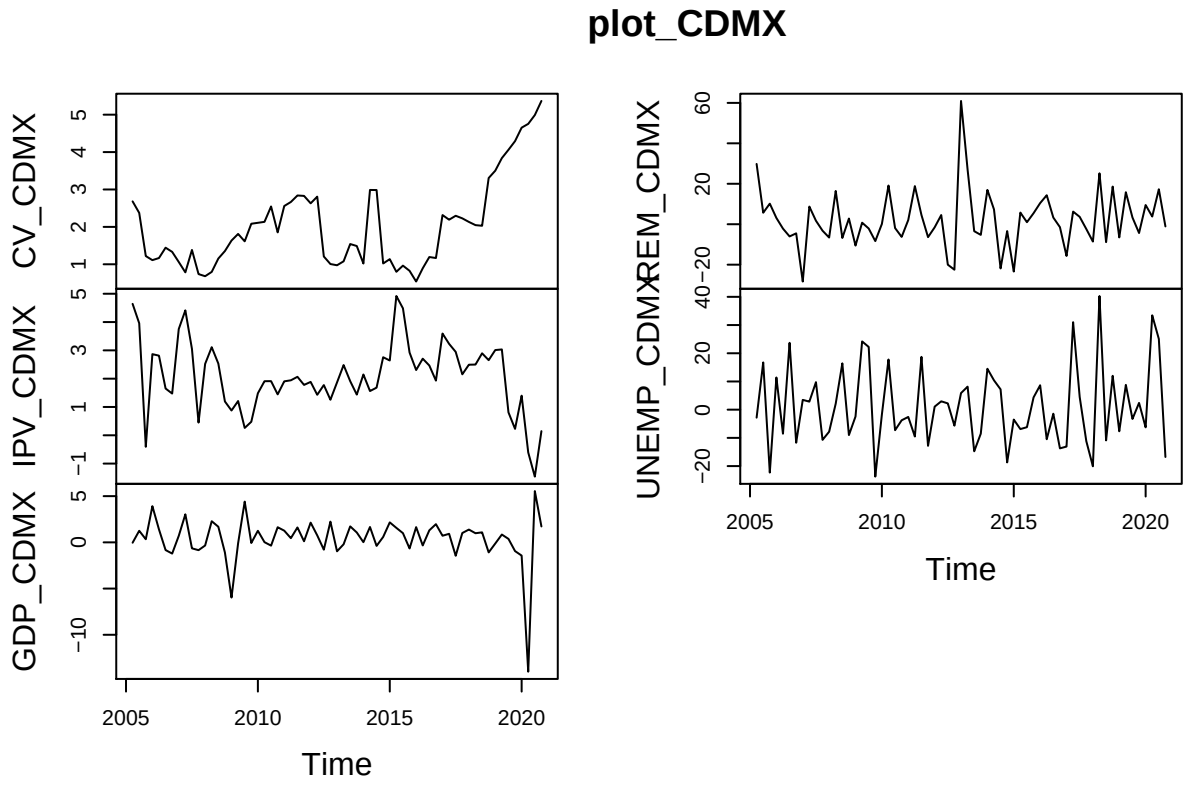

```
CV_CHIS <- CHIS[ ,1]
IPV_CHIS <- CHIS[ ,2]
GDP_CHIS <- CHIS[,5]
REM_CHIS <- CHIS[,4]
UNEMP_CHIS <- CHIS[,3]
INPC_SUB_CHIS <- CHIS[,6]
INPC_E_CHIS <- CHIS[,7]
M1_CHIS <- CHIS[,8]
CONF_CHIS <- CHIS[,9]
plot_CHIS<-ts(cbind(CV_CHIS,IPV_CHIS,GDP_CHIS,REM_CHIS,UNEMP_CHIS),start=c(2005,2),frequency=4)
plot(plot_CHIS)
```



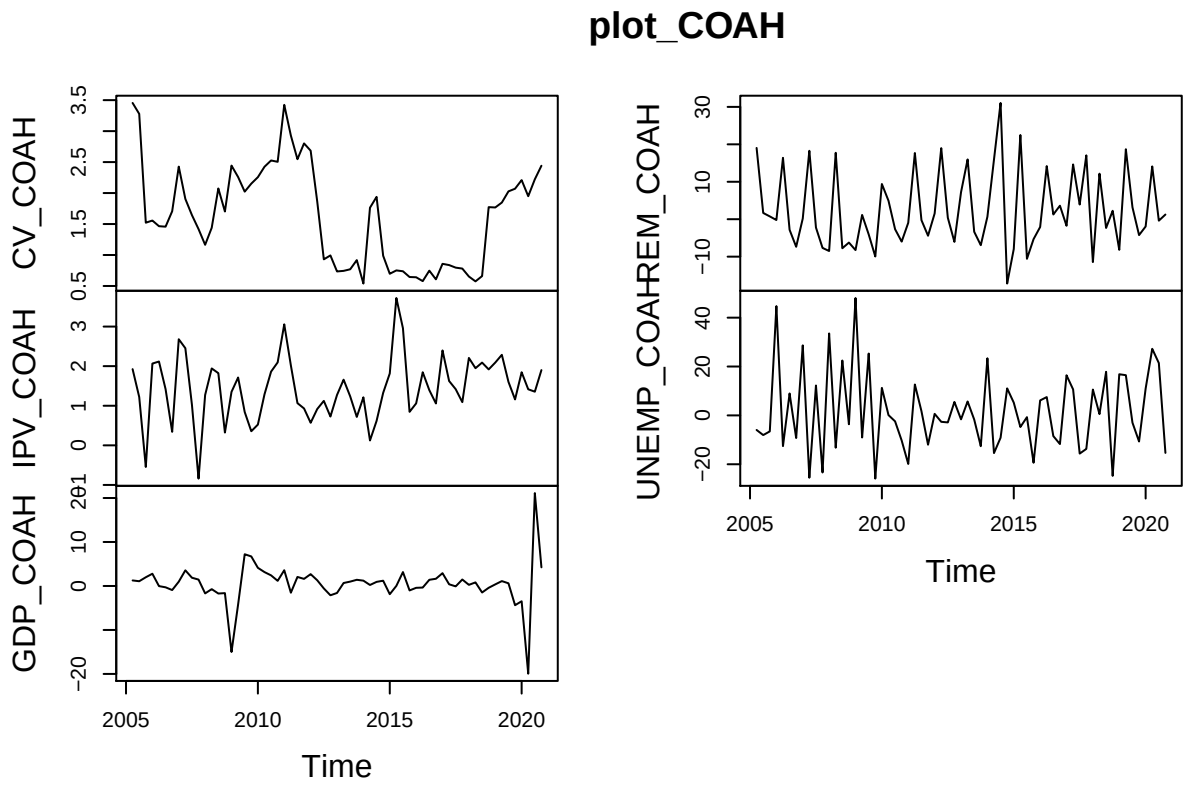

```
CV_CHIH <- CHIH[ ,1]
IPV_CHIH <- CHIH[ ,2]
GDP_CHIH <- CHIH[,5]
REM_CHIH <- CHIH[,4]
UNEMP_CHIH <- CHIH[,3]
INPC_SUB_CHIH <- CHIH[,6]
INPC_E_CHIH <- CHIH[,7]
M1_CHIH <- CHIH[,8]
CONF_CHIH <- CHIH[,9]
plot_CHIH<-ts(cbind(CV_CHIH,IPV_CHIH,GDP_CHIH,REM_CHIH,UNEMP_CHIH),start=c(2005,2),frequency=4)
plot(plot_CHIH)
```



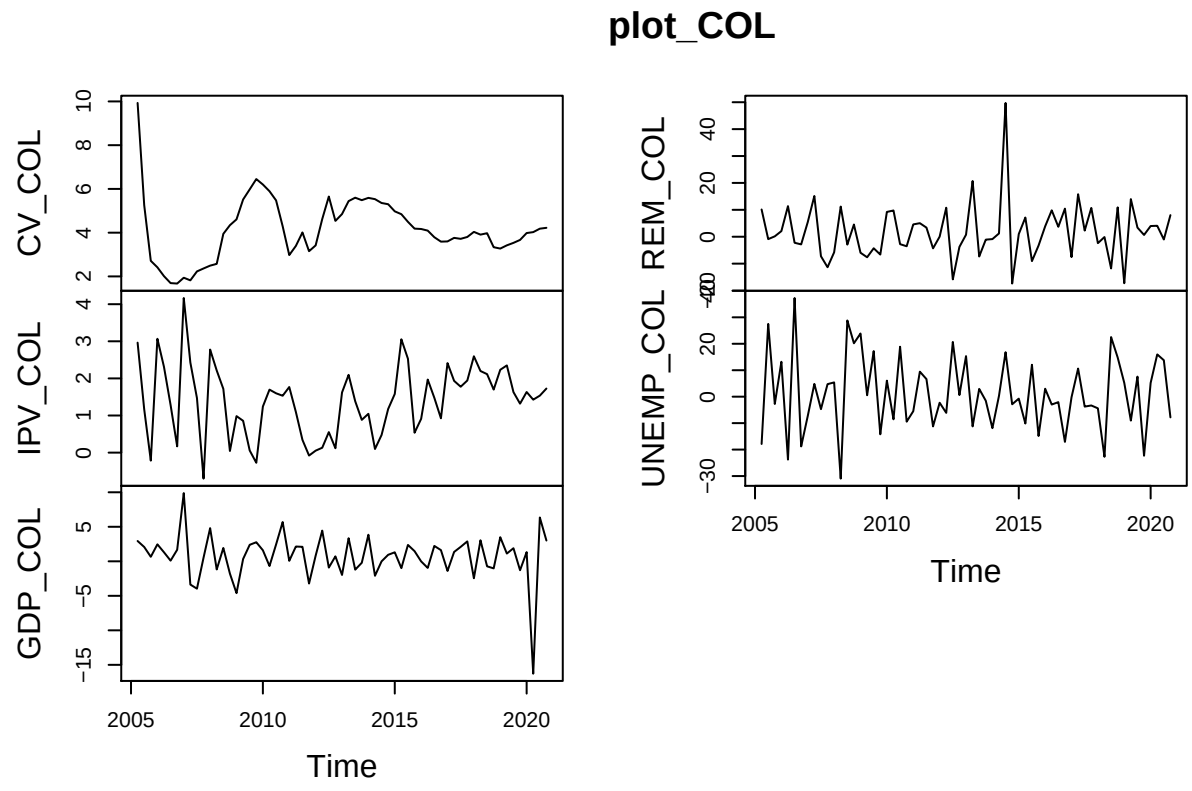

```
CV_CDMX <- CDMX[ ,1]
IPV_CDMX <- CDMX[ ,2]
GDP_CDMX <- CDMX[,5]
REM_CDMX <- CDMX[,4]
UNEMP_CDMX <- CDMX[,3]
INPC_SUB_CDMX <- CDMX[,6]
INPC_E_CDMX <- CDMX[,7]
M1_CDMX <- CDMX[,8]
CONF_CDMX <- CDMX[,9]
plot_CDMX<-ts(cbind(CV_CDMX,IPV_CDMX,GDP_CDMX,REM_CDMX,UNEMP_CDMX),start=c(2005,2),frequency=4)
plot(plot_CDMX)
```



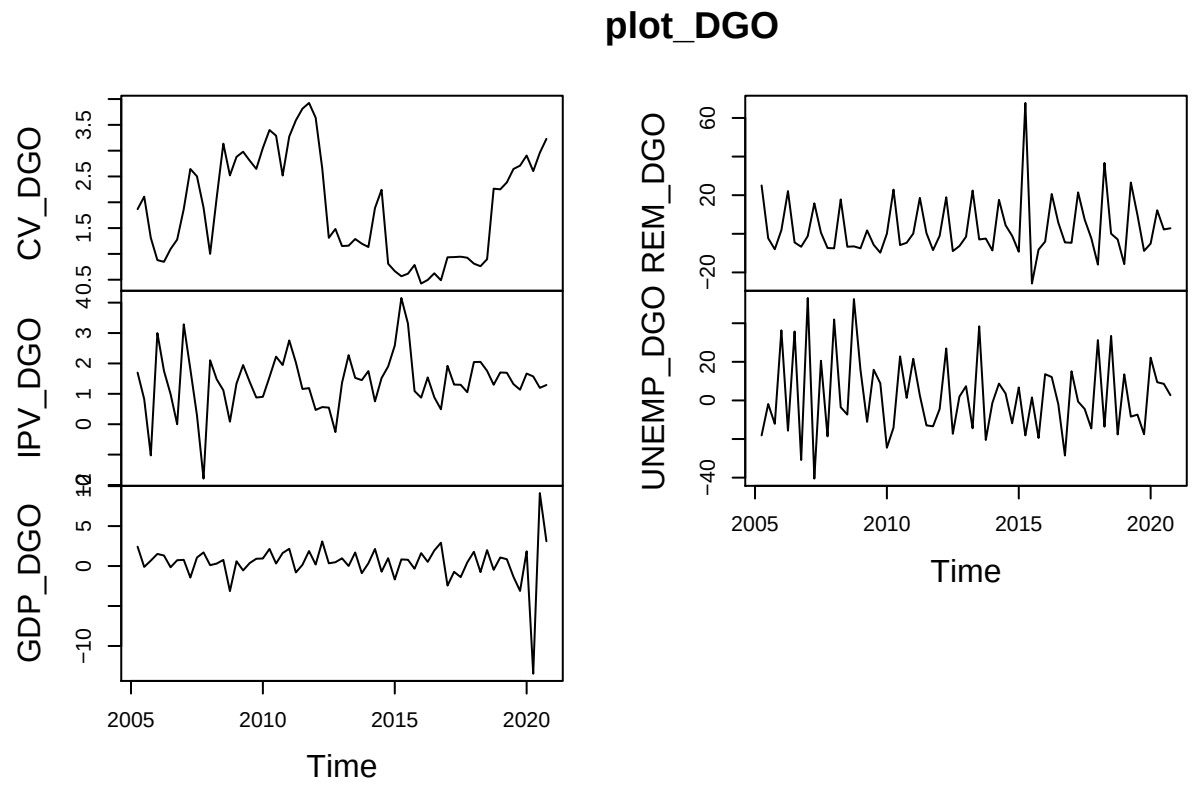

```
CV_COAH <- COAH[ ,1]
IPV_COAH <- COAH[ ,2]
GDP_COAH <- COAH[,5]
REM_COAH <- COAH[,4]
UNEMP_COAH <- COAH[,3]
INPC_SUB_COAH <- COAH[,6]
INPC_E_COAH <- COAH[,7]
M1_COAH <- COAH[,8]
CONF_COAH <- COAH[,9]
plot_COAH<-ts(cbind(CV_COAH,IPV_COAH,GDP_COAH,REM_COAH,UNEMP_COAH),start=c(2005,2),frequency=4)
plot(plot_COAH)
```



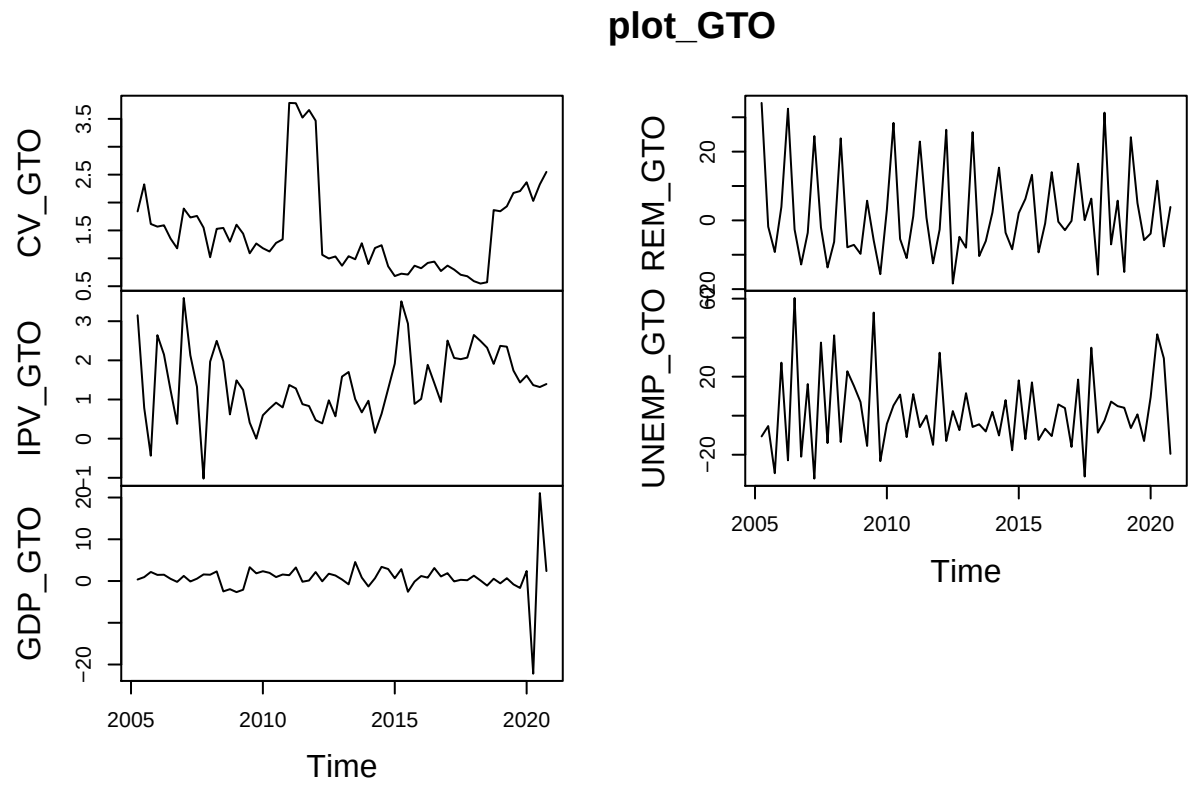

```
CV_COL <- COL[ ,1]
IPV_COL <- COL[ ,2]
GDP_COL <- COL[,5]
REM_COL <- COL[,4]
UNEMP_COL <- COL[,3]
INPC_SUB_COL <- COL[,6]
INPC_E_COL <- COL[,7]
M1_COL <- COL[,8]
CONF_COL <- COL[,9]
plot_COL<-ts(cbind(CV_COL,IPV_COL,GDP_COL,REM_COL,UNEMP_COL),start=c(2005,2),frequency=4)
plot(plot_COL)
```



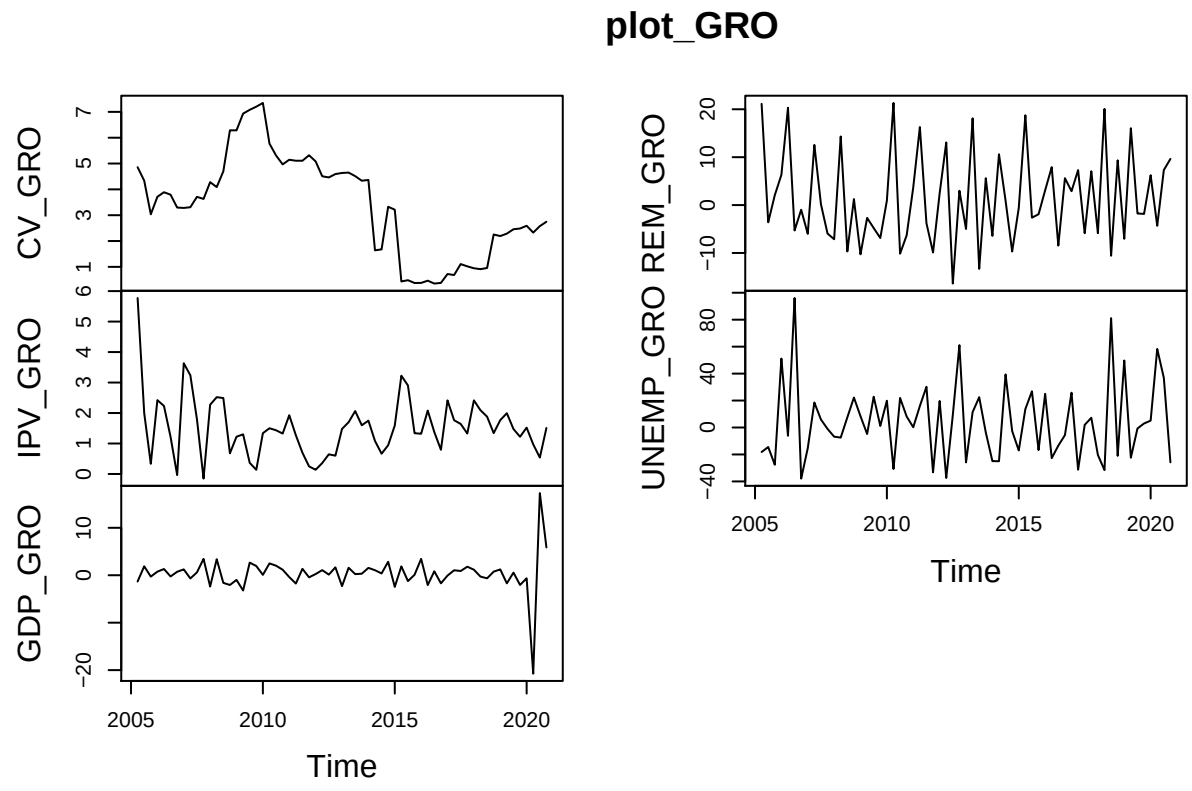

```
CV_DGO <- DGO[ ,1]
IPV_DGO <- DGO[ ,2]
GDP_DGO <- DGO[,5]
REM_DGO <- DGO[,4]
UNEMP_DGO <- DGO[,3]
INPC_SUB_DGO <- DGO[,6]
INPC_E_DGO <- DGO[,7]
M1_DGO <- DGO[,8]
CONF_DGO <- DGO[,9]
plot_DGO<-ts(cbind(CV_DGO,IPV_DGO,GDP_DGO,REM_DGO,UNEMP_DGO),start=c(2005,2),frequency=4)
plot(plot_DGO)
```



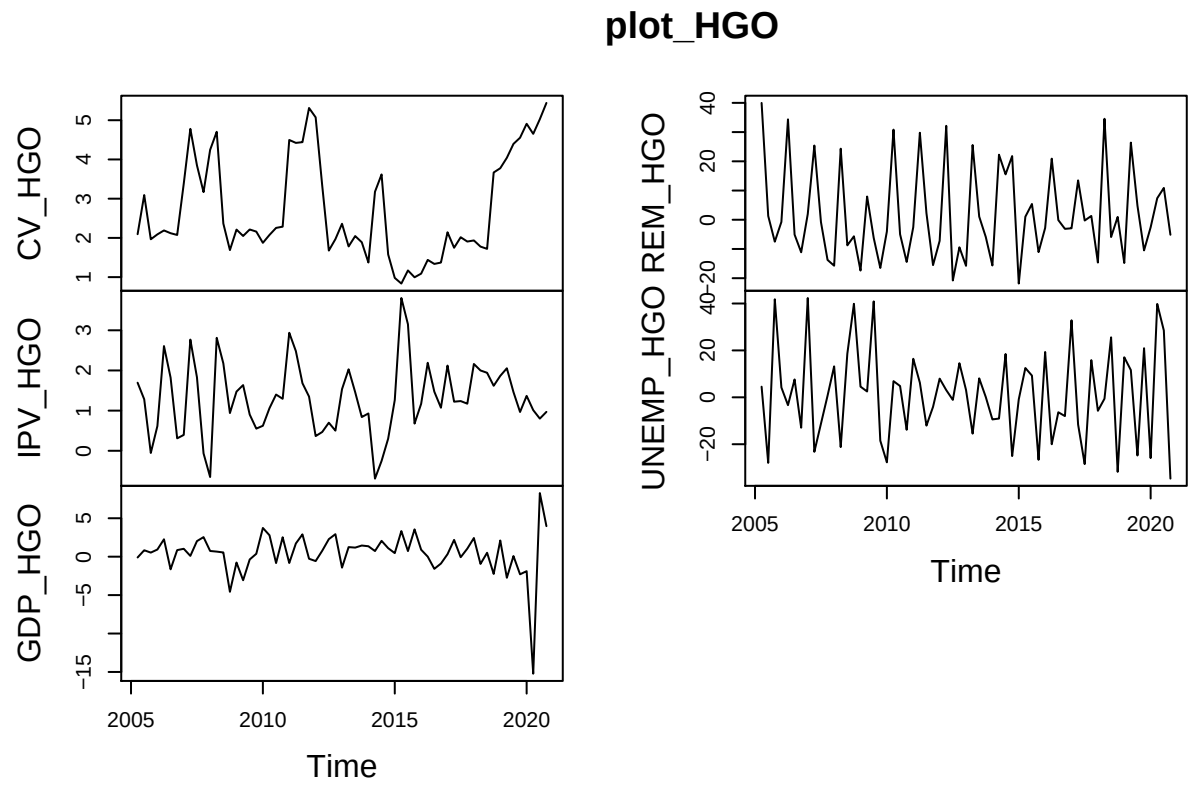

```
CV_GTO <- GTO[ ,1]
IPV_GTO <- GTO[ ,2]
GDP_GTO <- GTO[,5]
REM_GTO <- GTO[,4]
UNEMP_GTO <- GTO[,3]
INPC_SUB_GTO <- GTO[,6]
INPC_E_GTO <- GTO[,7]
M1_GTO <- GTO[,8]
CONF_GTO <- GTO[,9]
plot_GTO<-ts(cbind(CV_GTO,IPV_GTO,GDP_GTO,REM_GTO,UNEMP_GTO),start=c(2005,2),frequency=4)
plot(plot_GTO)
```



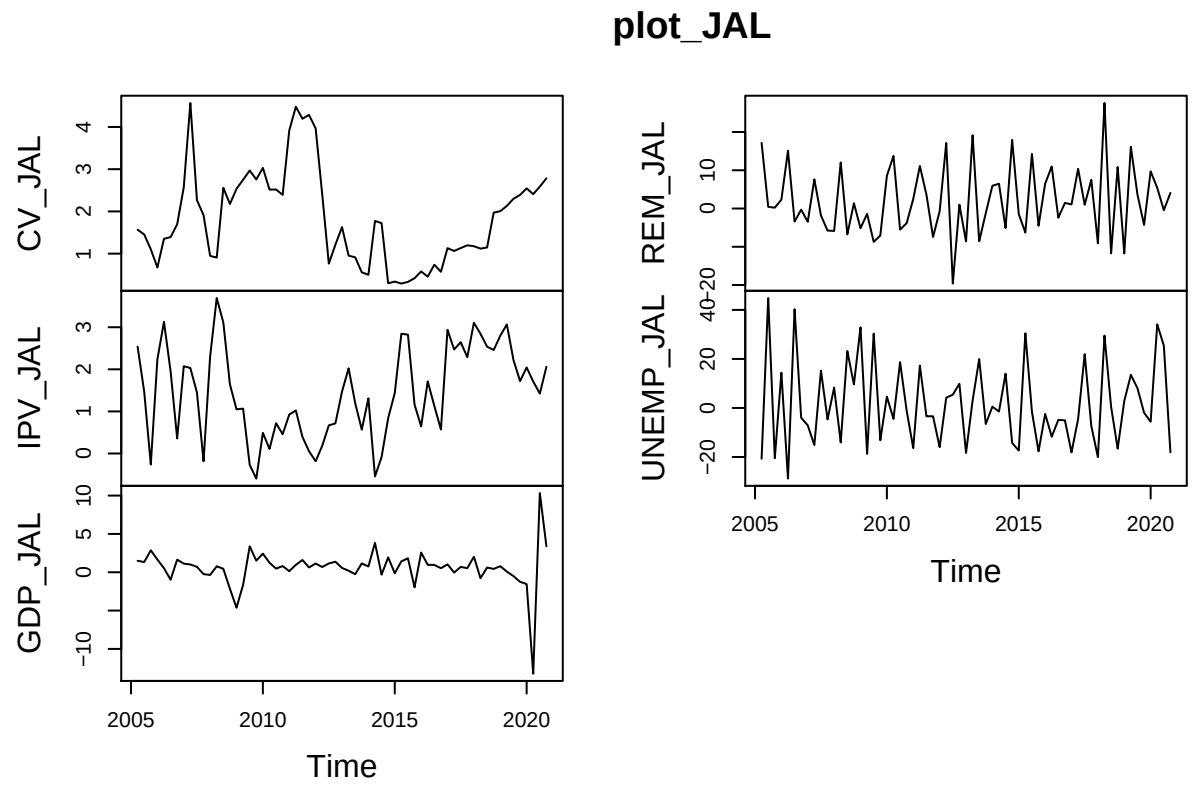

```
CV_GRO <- GRO[ ,1]
IPV_GRO <- GRO[ ,2]
GDP_GRO <- GRO[,5]
REM_GRO <- GRO[,4]
UNEMP_GRO <- GRO[,3]
INPC_SUB_GRO <- GRO[,6]
INPC_E_GRO <- GRO[,7]
M1_GRO <- GRO[,8]
CONF_GRO <- GRO[,9]
plot_GRO<-ts(cbind(CV_GRO,IPV_GRO,GDP_GRO,REM_GRO,UNEMP_GRO),start=c(2005,2),frequency=4)
plot(plot_GRO)
```



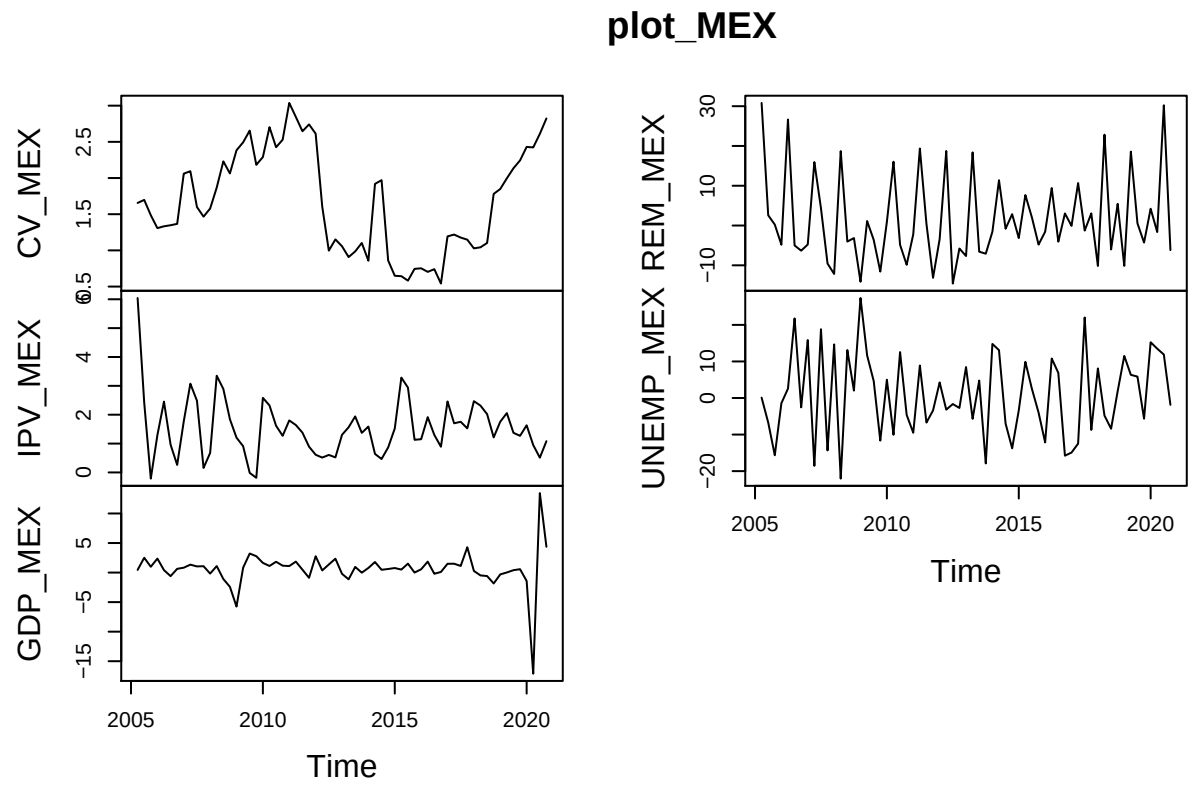

```
CV_HGO <- HGO[ ,1]
IPV_HGO <- HGO[ ,2]
GDP_HGO <- HGO[,5]
REM_HGO <- HGO[,4]
UNEMP_HGO <- HGO[,3]
INPC_SUB_HGO <- HGO[,6]
INPC_E_HGO <- HGO[,7]
M1_HGO <- HGO[,8]
CONF_HGO <- HGO[,9]
plot_HGO<-ts(cbind(CV_HGO,IPV_HGO,GDP_HGO,REM_HGO,UNEMP_HGO),start=c(2005,2),frequency=4)
plot(plot_HGO)
```



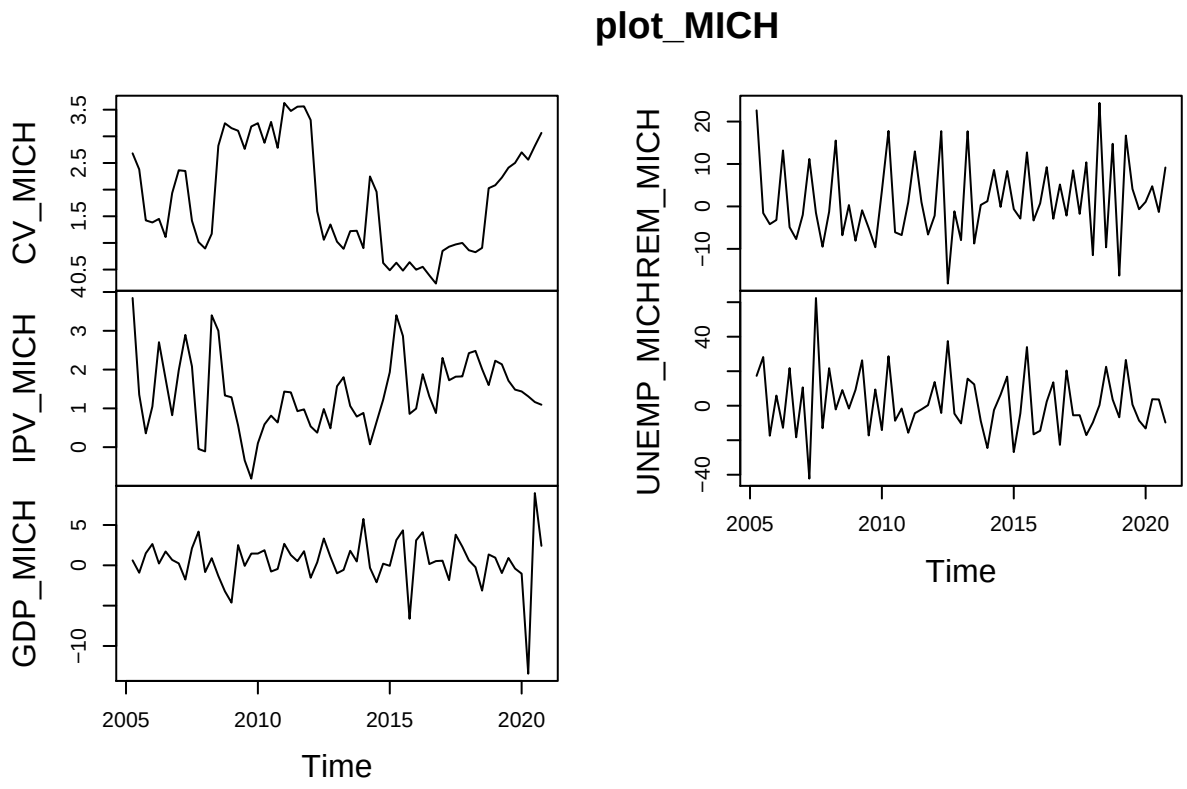

```
CV_JAL <- JAL[ ,1]
IPV_JAL <- JAL[ ,2]
GDP_JAL <- JAL[,5]
REM_JAL <- JAL[,4]
UNEMP_JAL <- JAL[,3]
INPC_SUB_JAL <- JAL[,6]
INPC_E_JAL <- JAL[,7]
M1_JAL <- JAL[,8]
CONF_JAL <- JAL[,9]
plot_JAL<-ts(cbind(CV_JAL,IPV_JAL,GDP_JAL,REM_JAL,UNEMP_JAL),start=c(2005,2),frequency=4)
plot(plot_JAL)
```



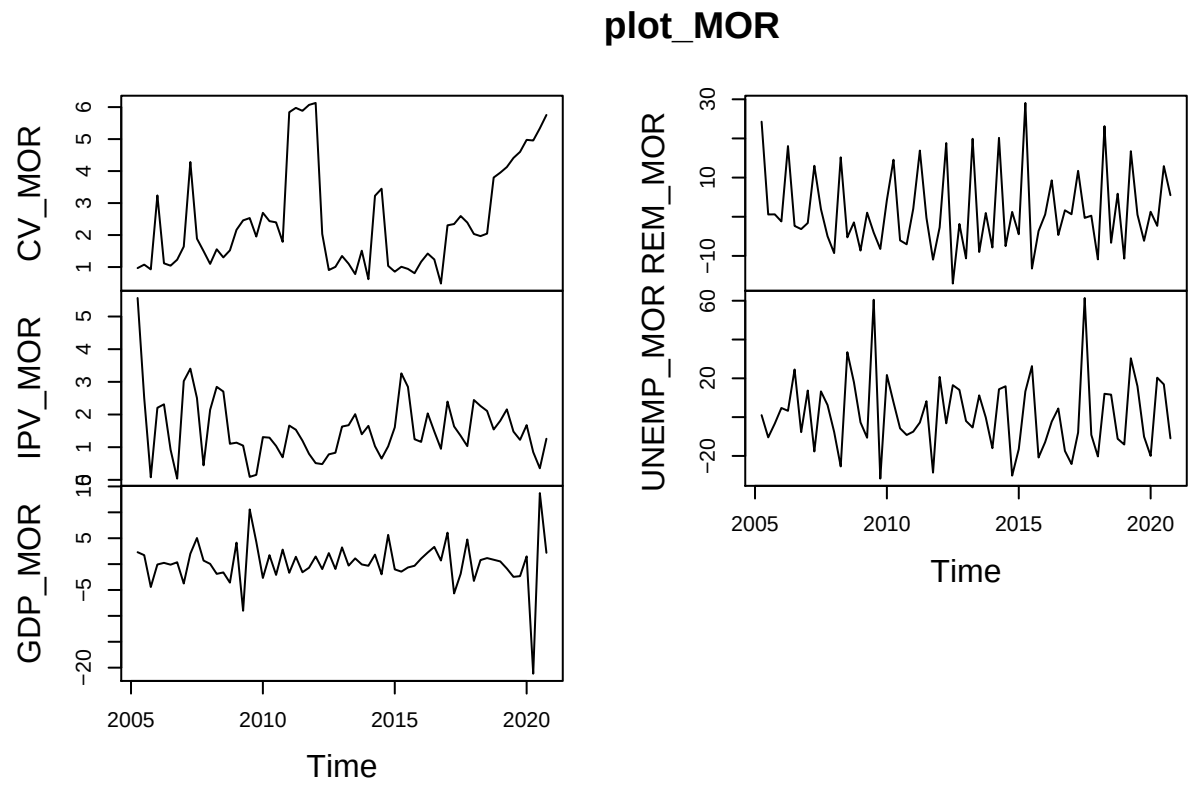

```
CV_MEX <- MEX[ ,1]
IPV_MEX <- MEX[ ,2]
GDP_MEX <- MEX[,5]
REM_MEX <- MEX[,4]
UNEMP_MEX <- MEX[,3]
INPC_SUB_MEX <- MEX[,6]
INPC_E_MEX <- MEX[,7]
M1_MEX <- MEX[,8]
CONF_MEX <- MEX[,9]
plot_MEX<-ts(cbind(CV_MEX,IPV_MEX,GDP_MEX,REM_MEX,UNEMP_MEX),start=c(2005,2),frequency=4)
plot(plot_MEX)
```



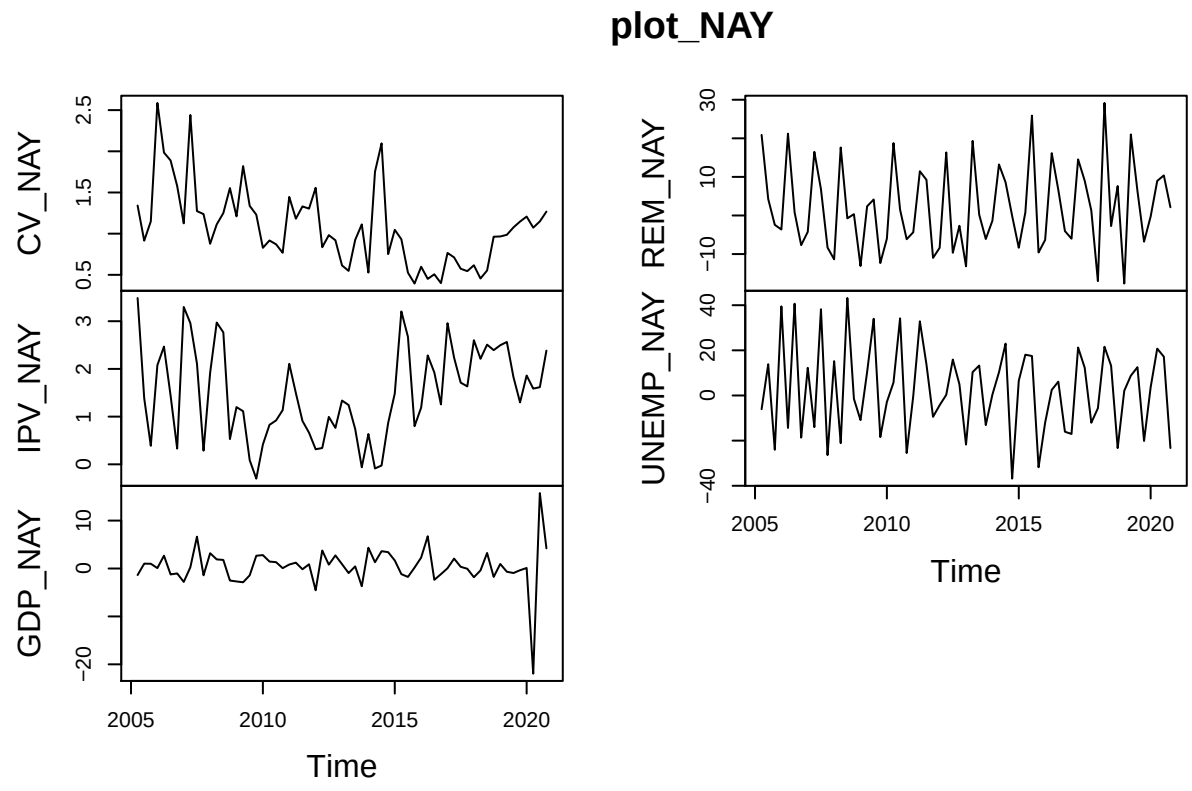

```
CV_MICH <- MICH[ ,1]
IPV_MICH <- MICH[ ,2]
GDP_MICH <- MICH[,5]
REM_MICH <- MICH[,4]
UNEMP_MICH <- MICH[,3]
INPC_SUB_MICH <- MICH[,6]
INPC_E_MICH <- MICH[,7]
M1_MICH <- MICH[,8]
CONF_MICH <- MICH[,9]
plot_MICH<-ts(cbind(CV_MICH,IPV_MICH,GDP_MICH,REM_MICH,UNEMP_MICH),start=c(2005,2),frequency=4)
plot(plot_MICH)
```



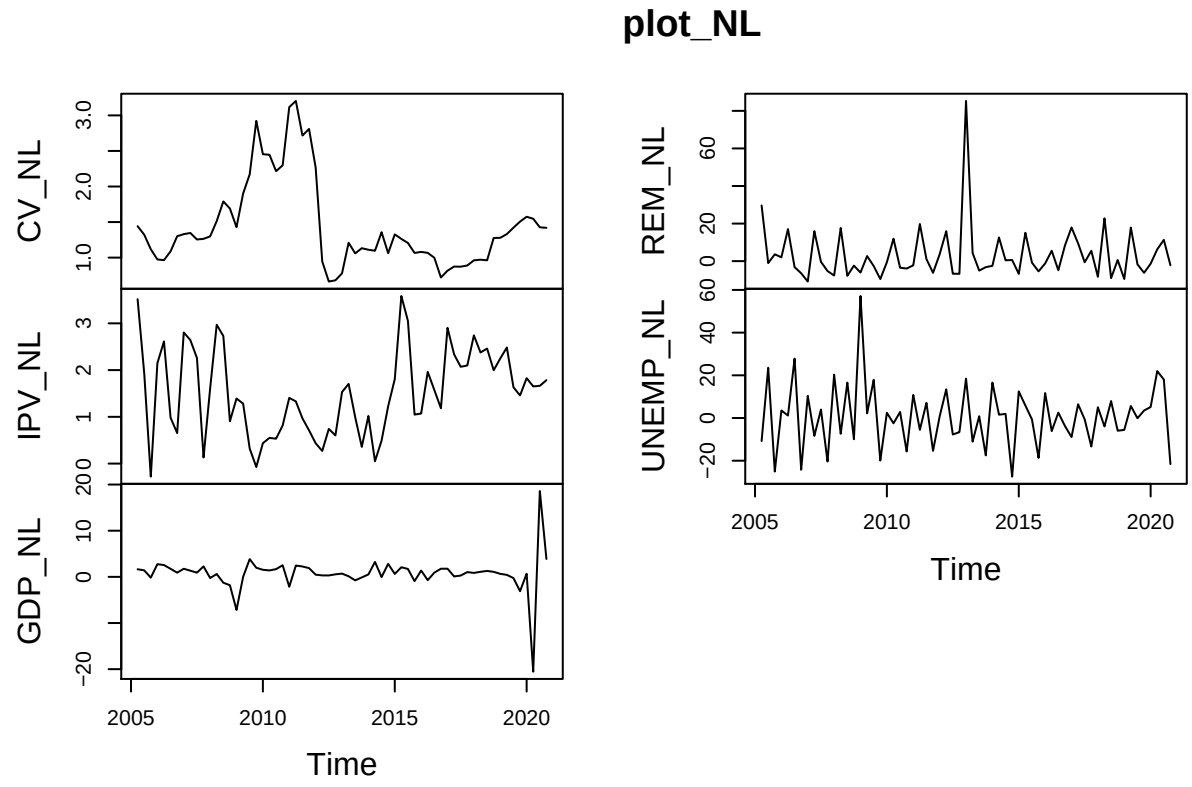

```
CV_MOR <- MOR[ ,1]
IPV_MOR <- MOR[ ,2]
GDP_MOR <- MOR[,5]
REM_MOR <- MOR[,4]
UNEMP_MOR <- MOR[,3]
INPC_SUB_MOR <- MOR[,6]
INPC_E_MOR <- MOR[,7]
M1_MOR <- MOR[,8]
CONF_MOR <- MOR[,9]
plot_MOR<-ts(cbind(CV_MOR,IPV_MOR,GDP_MOR,REM_MOR,UNEMP_MOR),start=c(2005,2),frequency=4)
plot(plot_MOR)
```



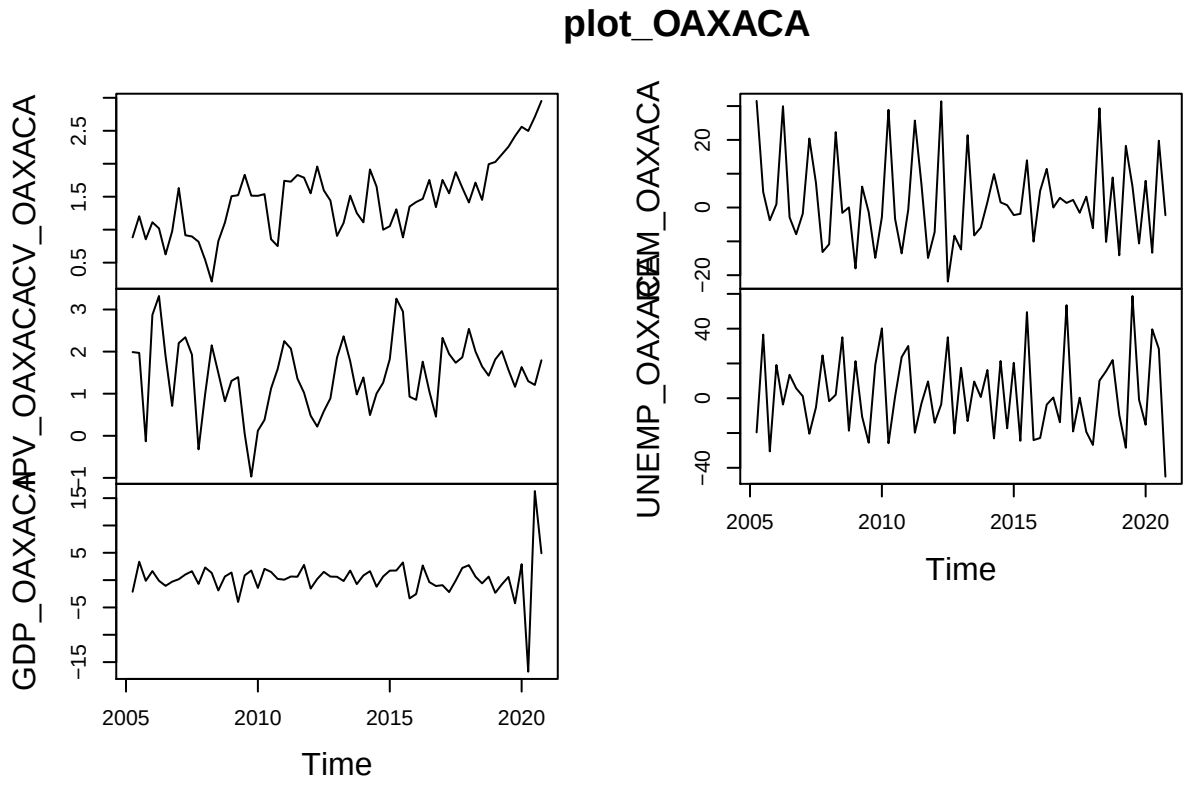

```
CV_NAY <- NAY[ ,1]
IPV_NAY <- NAY[ ,2]
GDP_NAY <- NAY[,5]
REM_NAY <- NAY[,4]
UNEMP_NAY <- NAY[,3]
INPC_SUB_NAY <- NAY[,6]
INPC_E_NAY <- NAY[,7]
M1_NAY <- NAY[,8]
CONF_NAY <- NAY[,9]
plot_NAY<-ts(cbind(CV_NAY,IPV_NAY,GDP_NAY,REM_NAY,UNEMP_NAY),start=c(2005,2),frequency=4)
plot(plot_NAY)
```



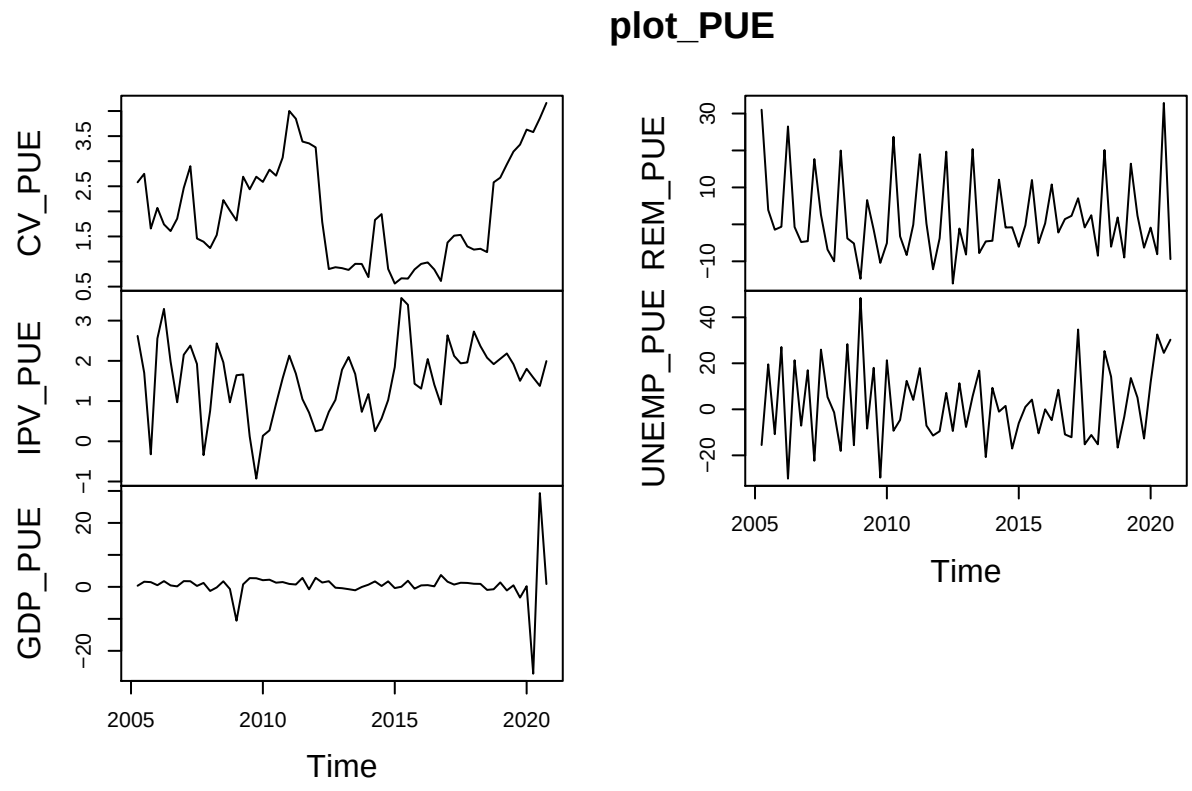

```
CV_NL <- NL[ ,1]
IPV_NL <- NL[ ,2]
GDP_NL <- NL[,5]
REM_NL <- NL[,4]
UNEMP_NL <- NL[,3]
INPC_SUB_NL <- NL[,6]
INPC_E_NL <- NL[,7]
M1_NL <- NL[,8]
CONF_NL <- NL[,9]
plot_NL<-ts(cbind(CV_NL,IPV_NL,GDP_NL,REM_NL,UNEMP_NL),start=c(2005,2),frequency=4)
plot(plot_NL)
```



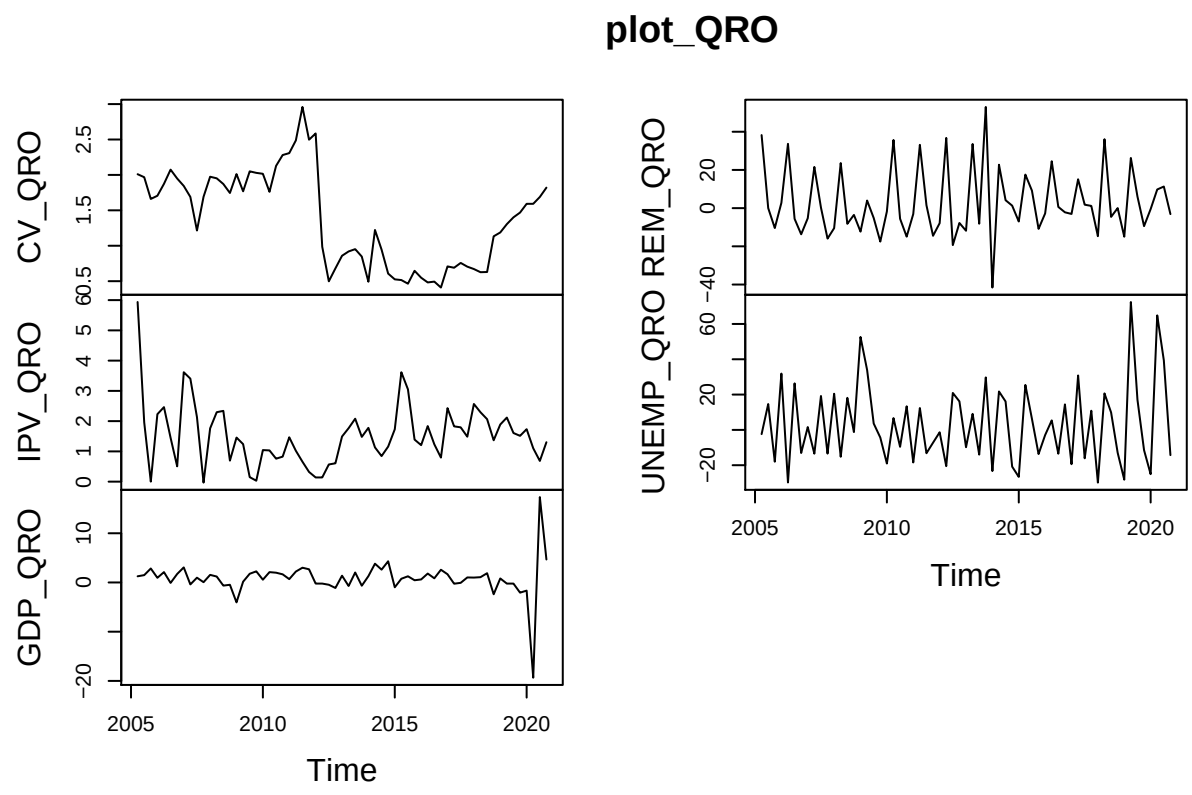

```
CV_OAXACA <- OAXACA[ ,1]
IPV_OAXACA <- OAXACA[ ,2]
GDP_OAXACA <- OAXACA[,5]
REM_OAXACA <- OAXACA[,4]
UNEMP_OAXACA <- OAXACA[,3]
INPC_SUB_OAXACA <- OAXACA[,6]
INPC_E_OAXACA <- OAXACA[,7]
M1_OAXACA <- OAXACA[,8]
CONF_OAXACA <- OAXACA[,9]
plot_OAXACA<-ts(cbind(CV_OAXACA,IPV_OAXACA,GDP_OAXACA,REM_OAXACA,UNEMP_OAXACA),start=c(2005,2),frequenc
plot(plot_OAXACA)
```



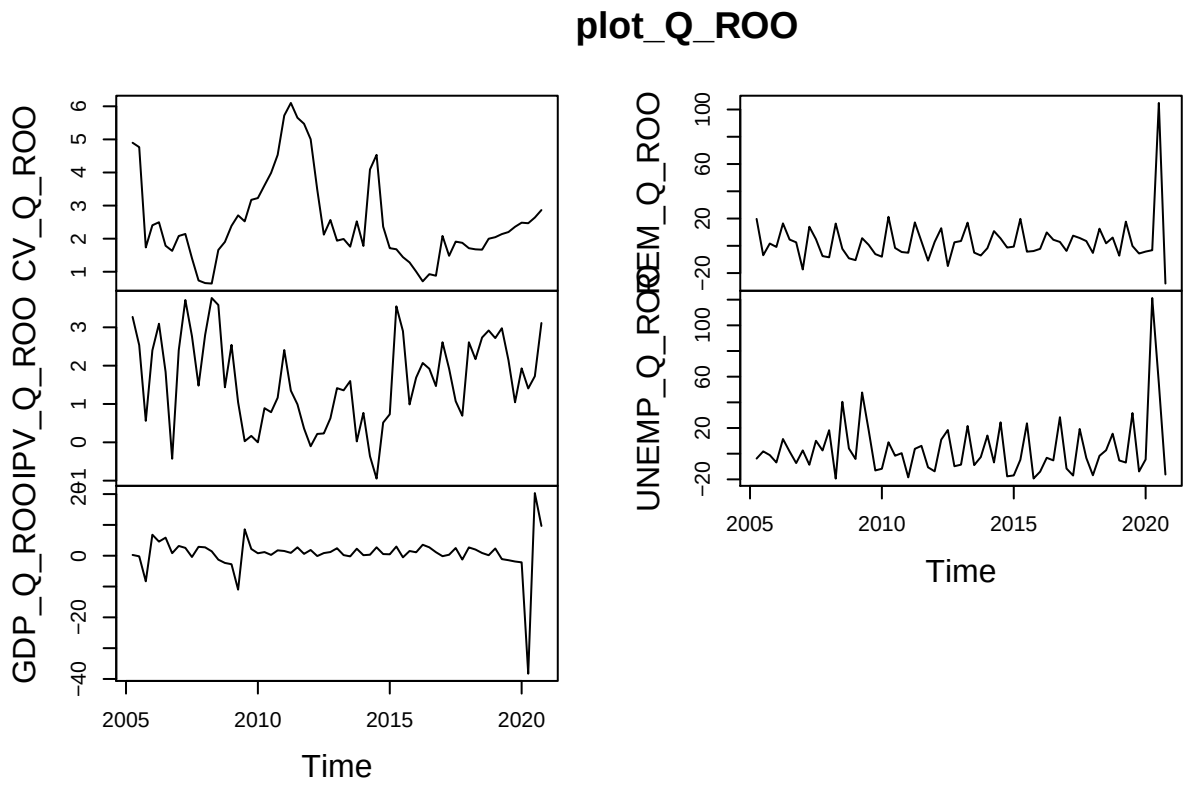

```
CV_PUE <- PUE[ ,1]
IPV_PUE <- PUE[ ,2]
GDP_PUE <- PUE[,5]
REM_PUE <- PUE[,4]
UNEMP_PUE <- PUE[,3]
INPC_SUB_PUE <- PUE[,6]
INPC_E_PUE <- PUE[,7]
M1_PUE <- PUE[,8]
CONF_PUE <- PUE[,9]
plot_PUE<-ts(cbind(CV_PUE,IPV_PUE,GDP_PUE,REM_PUE,UNEMP_PUE),start=c(2005,2),frequency=4)
plot(plot_PUE)
```



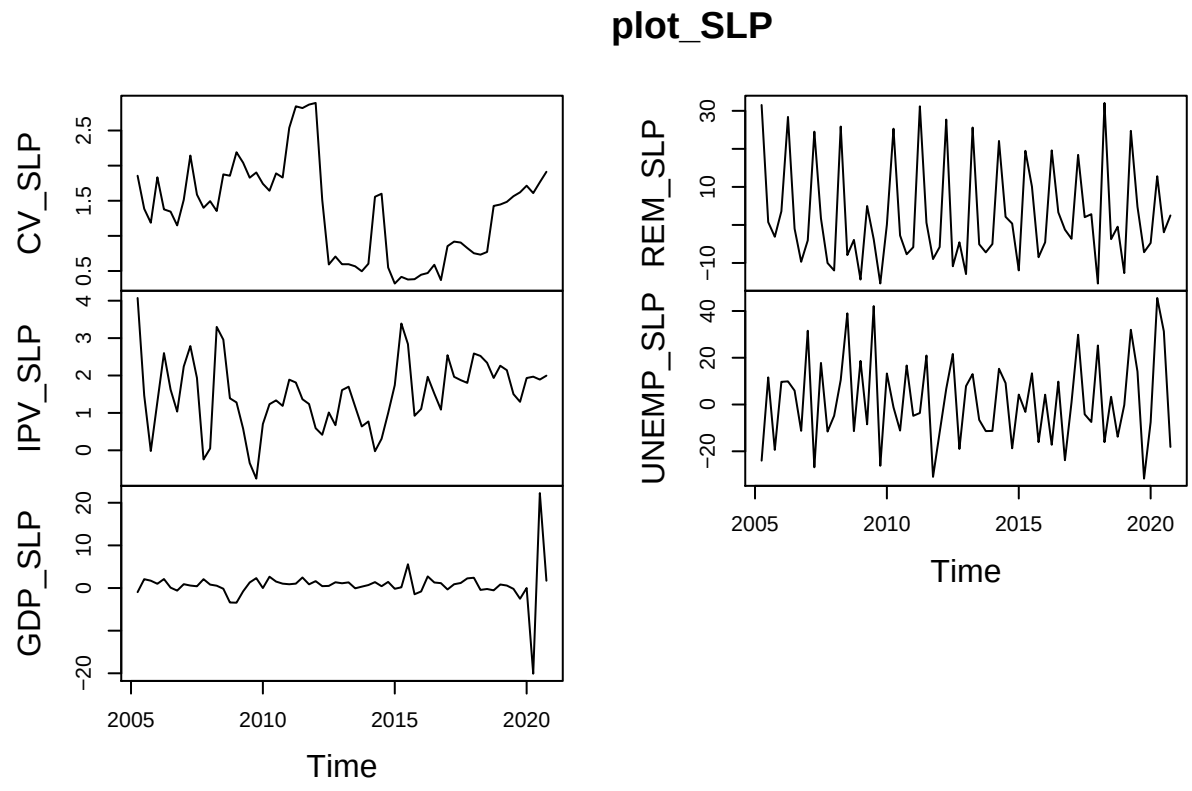

```
CV_QRO <- QRO[ ,1]
IPV_QRO <- QRO[ ,2]
GDP_QRO <- QRO[,5]
REM_QRO <- QRO[,4]
UNEMP_QRO <- QRO[,3]
INPC_SUB_QRO <- QRO[,6]
INPC_E_QRO <- QRO[,7]
M1_QRO <- QRO[,8]
CONF_QRO <- QRO[,9]
plot_QRO<-ts(cbind(CV_QRO,IPV_QRO,GDP_QRO,REM_QRO,UNEMP_QRO),start=c(2005,2),frequency=4)
plot(plot_QRO)
```



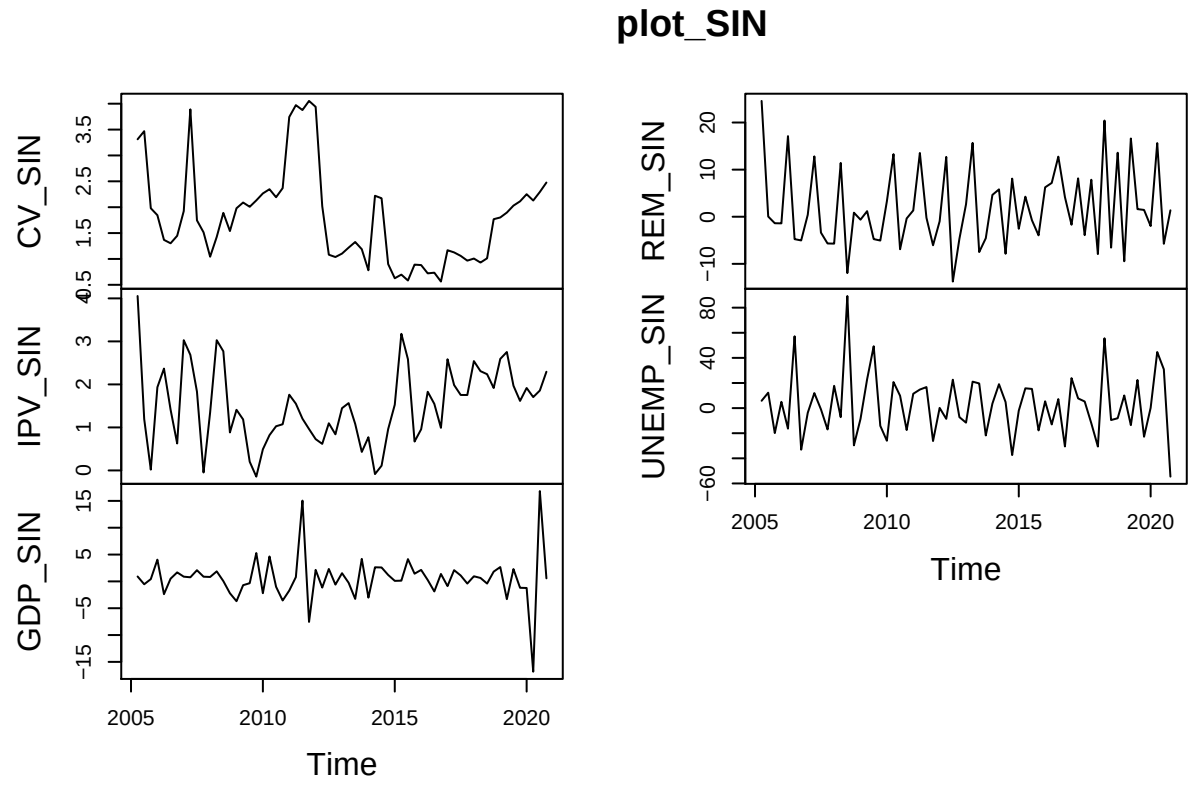

```
CV_Q_ROO <- Q_ROO[ ,1]
IPV_Q_ROO <- Q_ROO[ ,2]
GDP_Q_ROO <- Q_ROO[,5]
REM_Q_ROO <- Q_ROO[,4]
UNEMP_Q_ROO <- Q_ROO[,3]
INPC_SUB_Q_ROO <- Q_ROO[,6]
INPC_E_Q_ROO <- Q_ROO[,7]
M1_Q_ROO <- Q_ROO[,8]
CONF_Q_ROO <- Q_ROO[,9]
plot_Q_ROO<-ts(cbind(CV_Q_ROO,IPV_Q_ROO,GDP_Q_ROO,REM_Q_ROO,UNEMP_Q_ROO),start=c(2005,2),frequency=4)
plot(plot_Q_ROO)
```



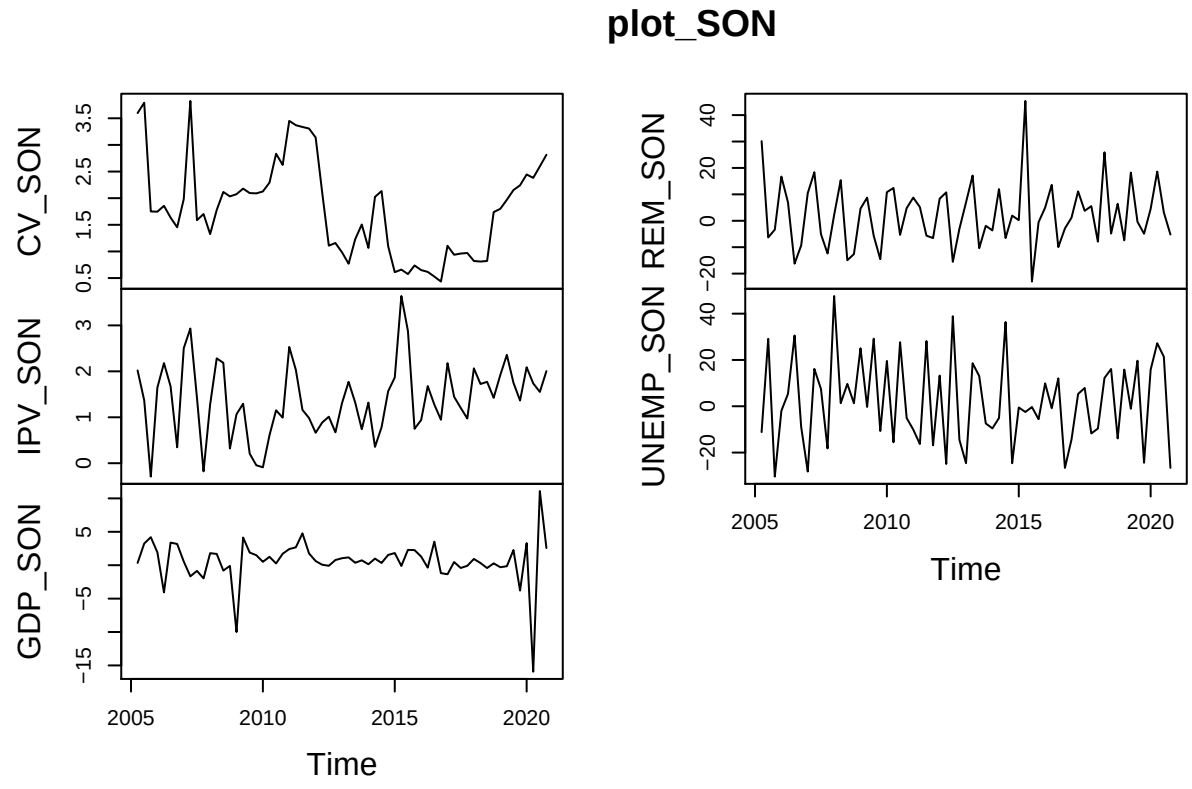

```
CV_SLP <- SLP[ ,1]
IPV_SLP <- SLP[ ,2]
GDP_SLP <- SLP[,5]
REM_SLP <- SLP[,4]
UNEMP_SLP <- SLP[,3]
INPC_SUB_SLP <- SLP[,6]
INPC_E_SLP <- SLP[,7]
M1_SLP <- SLP[,8]
CONF_SLP <- SLP[,9]
plot_SLP<-ts(cbind(CV_SLP,IPV_SLP,GDP_SLP,REM_SLP,UNEMP_SLP),start=c(2005,2),frequency=4)
plot(plot_SLP)
```



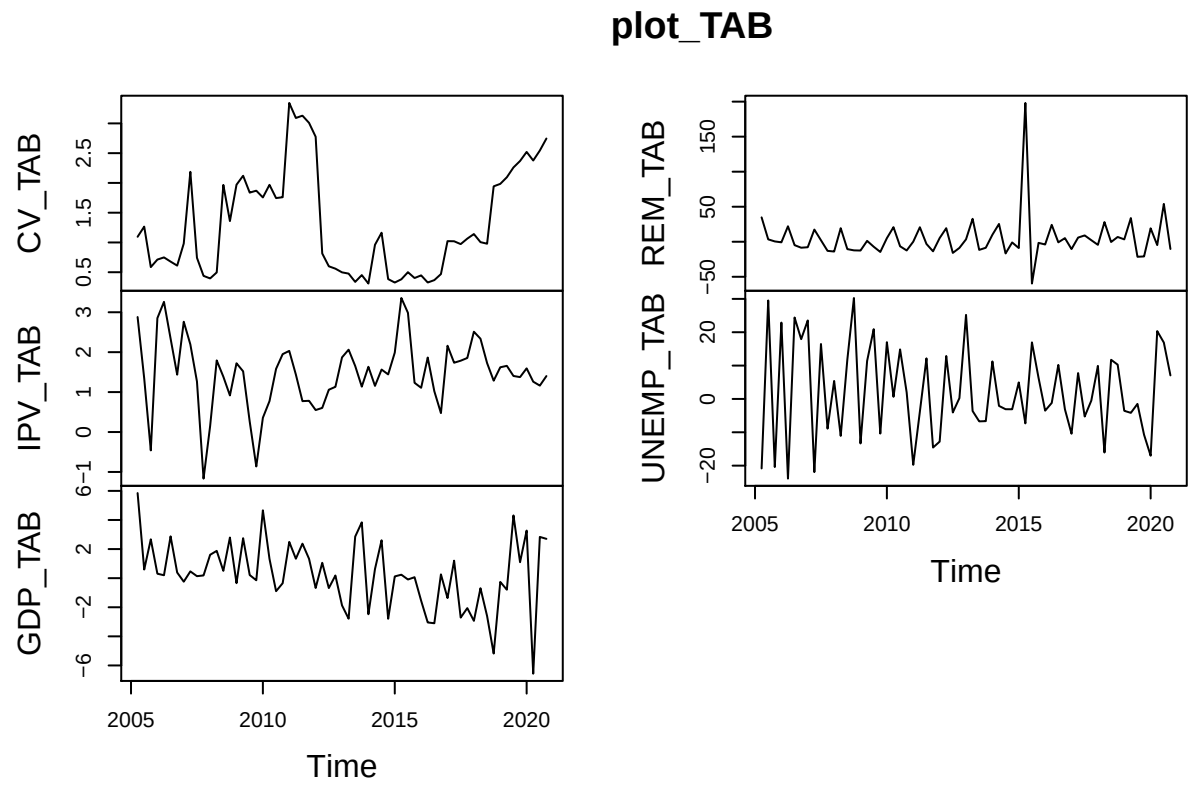

```
CV_SIN <- SIN[ ,1]
IPV_SIN <- SIN[ ,2]
GDP_SIN <- SIN[,5]
REM_SIN <- SIN[,4]
UNEMP_SIN <- SIN[,3]
INPC_SUB_SIN <- SIN[,6]
INPC_E_SIN <- SIN[,7]
M1_SIN <- SIN[,8]
CONF_SIN <- SIN[,9]
plot_SIN<-ts(cbind(CV_SIN,IPV_SIN,GDP_SIN,REM_SIN,UNEMP_SIN),start=c(2005,2),frequency=4)
plot(plot_SIN)
```



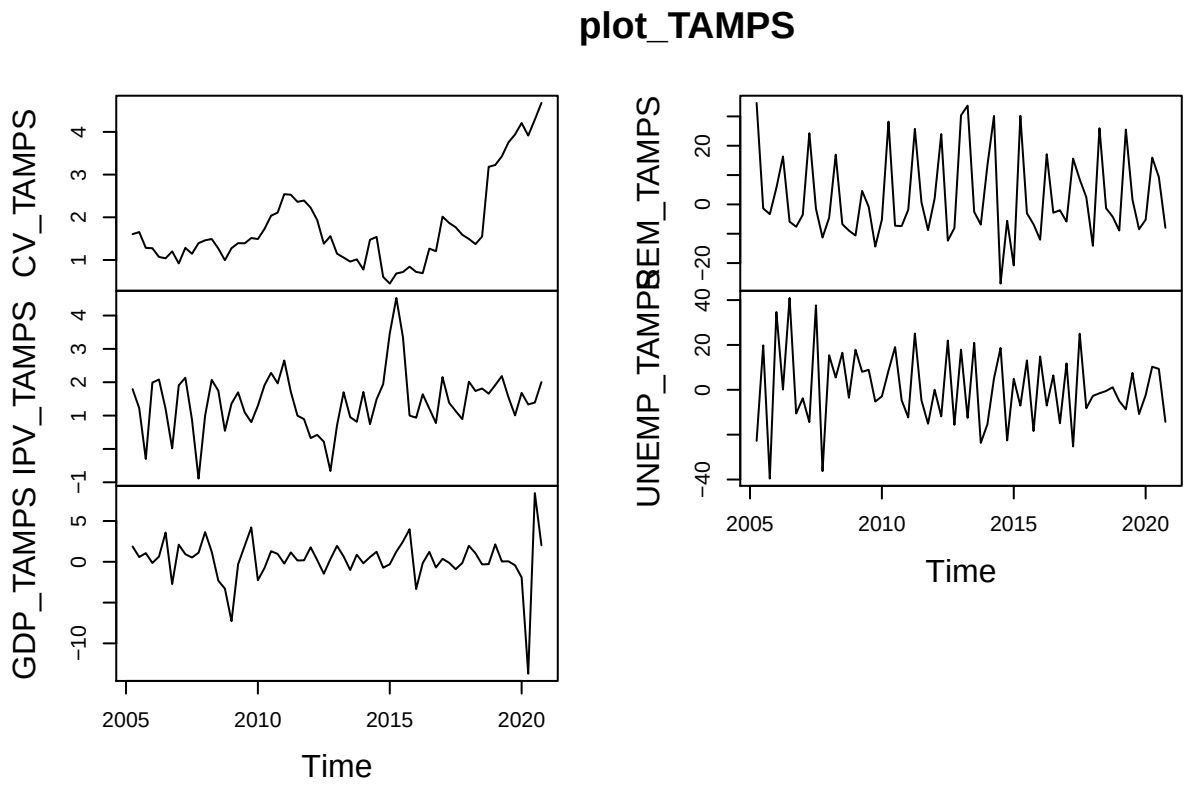

```
CV_SON <- SON[ ,1]
IPV_SON <- SON[ ,2]
GDP_SON <- SON[,5]
REM_SON <- SON[,4]
UNEMP_SON <- SON[,3]
INPC_SUB_SON <- SON[,6]
INPC_E_SON <- SON[,7]
M1_SON <- SON[,8]
CONF_SON <- SON[,9]
plot_SON<-ts(cbind(CV_SON,IPV_SON,GDP_SON,REM_SON,UNEMP_SON),start=c(2005,2),frequency=4)
plot(plot_SON)
```



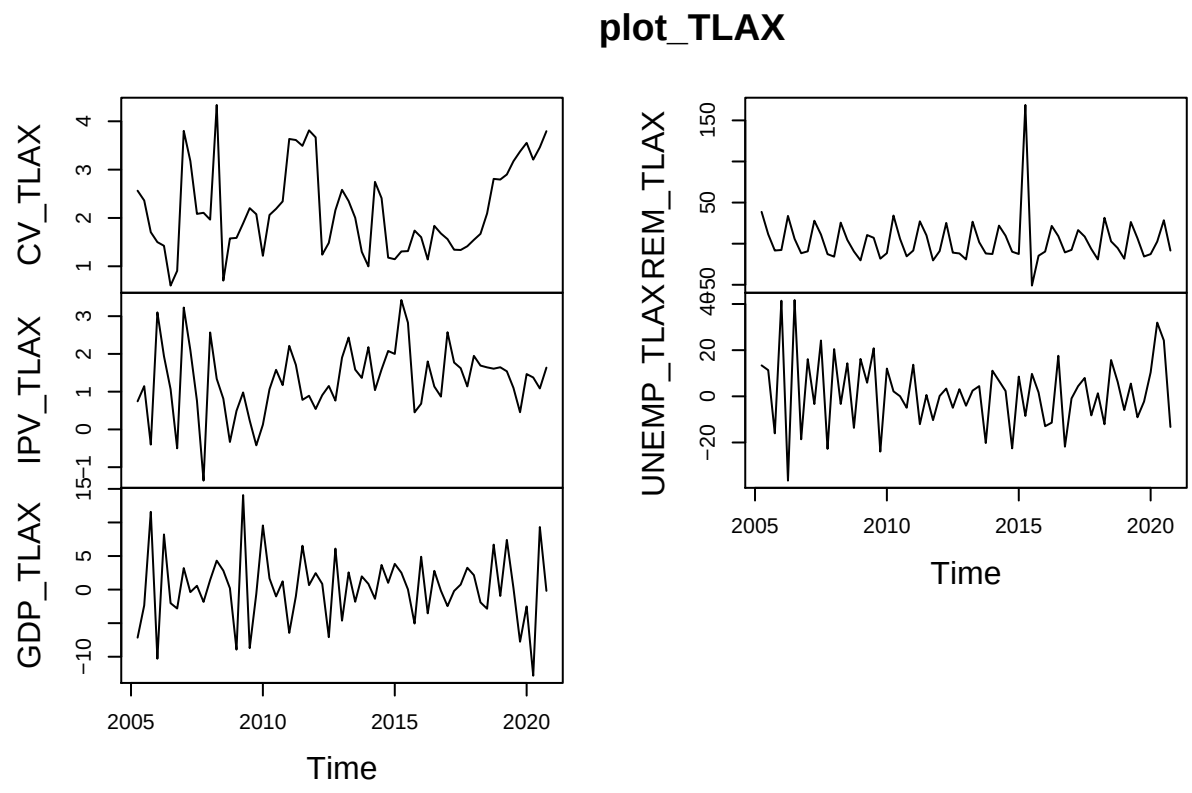

```
CV_TAB <- TAB[ ,1]
IPV_TAB <- TAB[ ,2]
GDP_TAB <- TAB[,5]
REM_TAB <- TAB[,4]
UNEMP_TAB <- TAB[,3]
INPC_SUB_TAB <- TAB[,6]
INPC_E_TAB <- TAB[,7]
M1_TAB <- TAB[,8]
CONF_TAB <- TAB[,9]
plot_TAB<-ts(cbind(CV_TAB,IPV_TAB,GDP_TAB,REM_TAB,UNEMP_TAB),start=c(2005,2),frequency=4)
plot(plot_TAB)
```



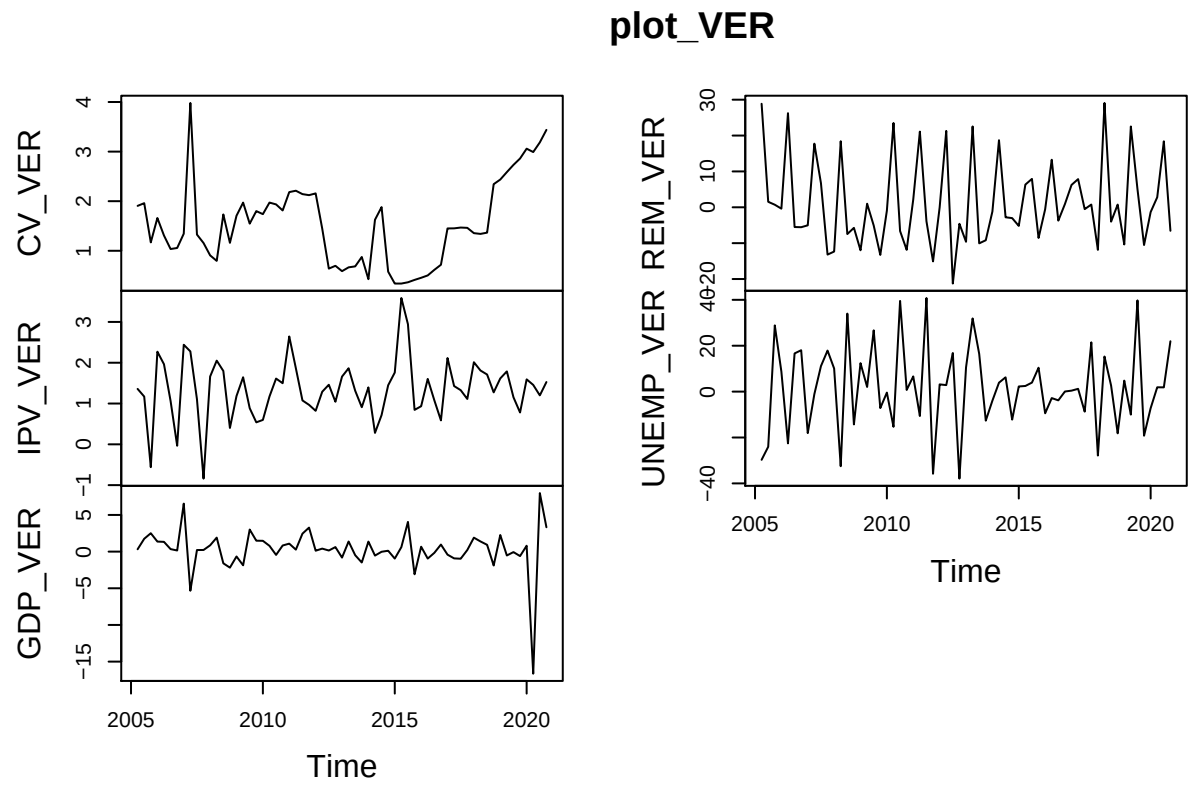

```
CV_TAMPS <- TAMPS[ ,1]
IPV_TAMPS <- TAMPS[ ,2]
GDP_TAMPS <- TAMPS[,5]
REM_TAMPS <- TAMPS[,4]
UNEMP_TAMPS <- TAMPS[,3]
INPC_SUB_TAMPS <- TAMPS[,6]
INPC_E_TAMPS <- TAMPS[,7]
M1_TAMPS <- TAMPS[,8]
CONF_TAMPS <- TAMPS[,9]
plot_TAMPS<-ts(cbind(CV_TAMPS,IPV_TAMPS,GDP_TAMPS,REM_TAMPS,UNEMP_TAMPS),start=c(2005,2),frequency=4)
plot(plot_TAMPS)
```



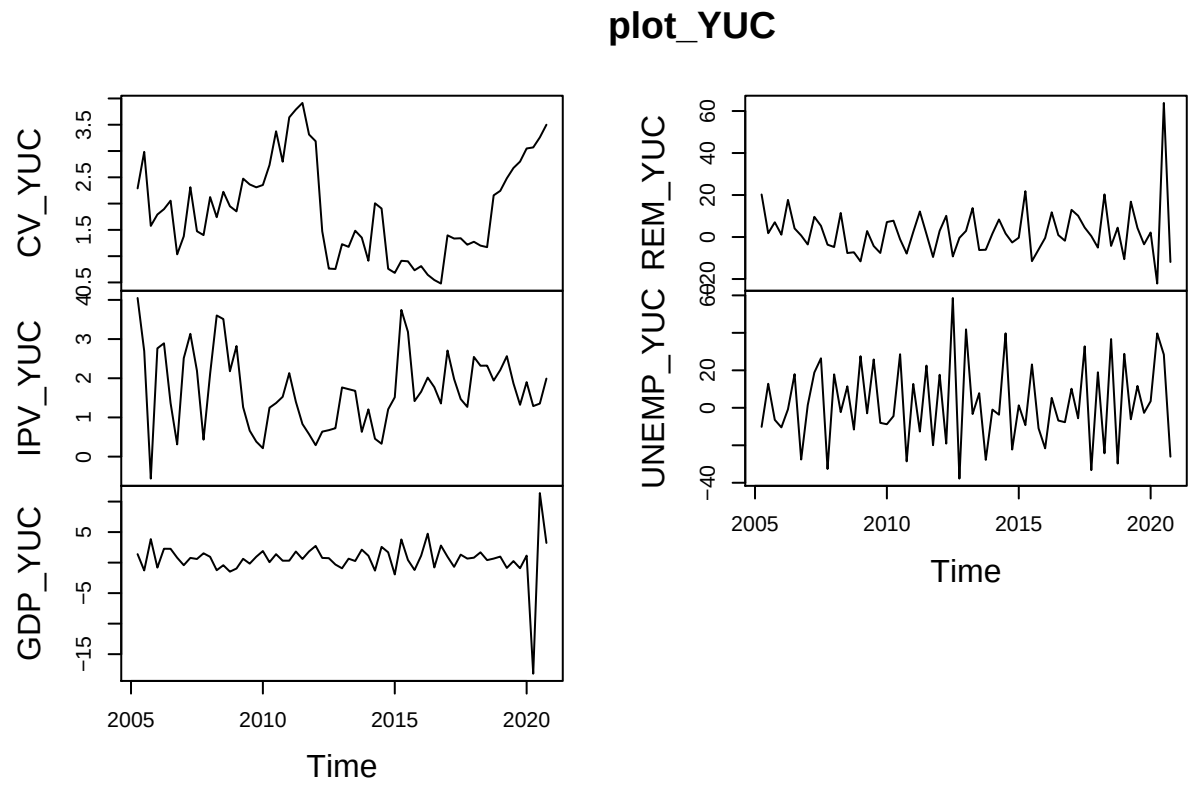

```
CV_TLAX <- TLAX[ ,1]
IPV_TLAX <- TLAX[ ,2]
GDP_TLAX <- TLAX[,5]
REM_TLAX <- TLAX[,4]
UNEMP_TLAX <- TLAX[,3]
INPC_SUB_TLAX <- TLAX[,6]
INPC_E_TLAX <- TLAX[,7]
M1_TLAX <- TLAX[,8]
CONF_TLAX <- TLAX[,9]
plot_TLAX<-ts(cbind(CV_TLAX,IPV_TLAX,GDP_TLAX,REM_TLAX,UNEMP_TLAX),start=c(2005,2),frequency=4)
plot(plot_TLAX)
```



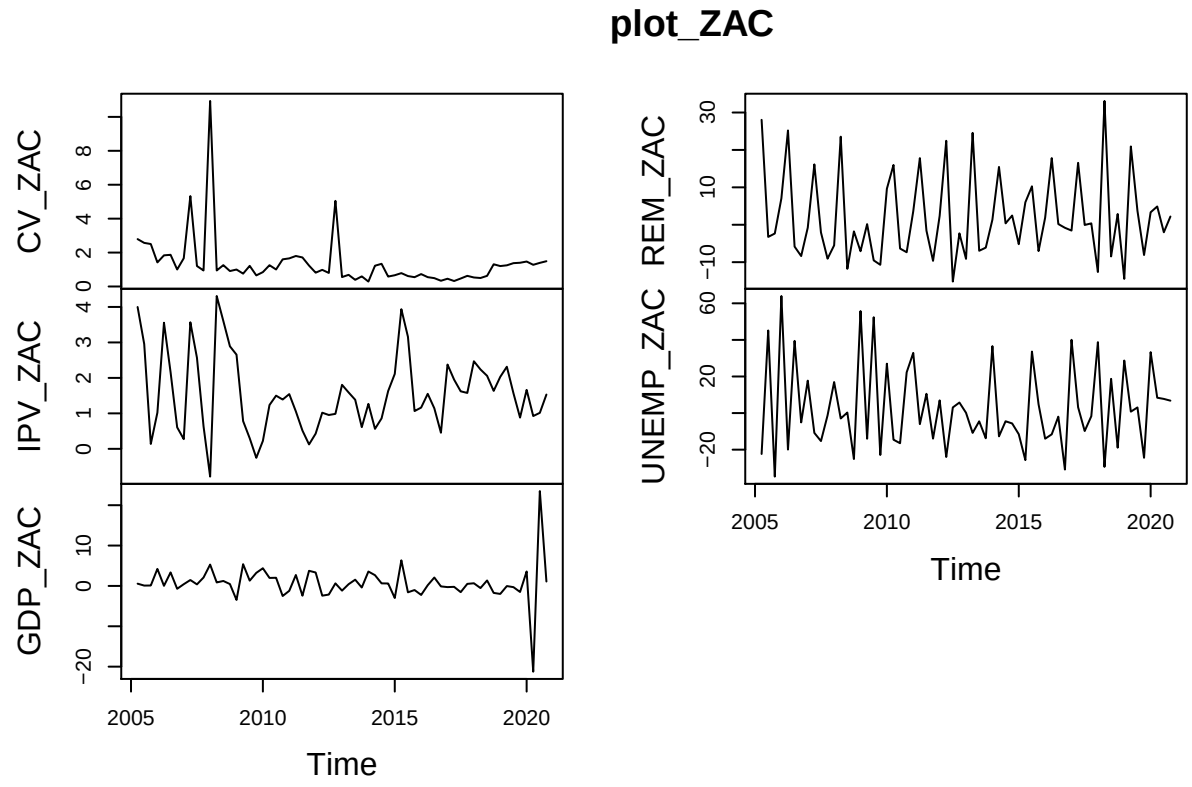

```
CV_VER <- VER[ ,1]
IPV_VER <- VER[ ,2]
GDP_VER <- VER[,5]
REM_VER <- VER[,4]
UNEMP_VER <- VER[,3]
INPC_SUB_VER <- VER[,6]
INPC_E_VER <- VER[,7]
M1_VER <- VER[,8]
CONF_VER <- VER[,9]
plot_VER<-ts(cbind(CV_VER,IPV_VER,GDP_VER,REM_VER,UNEMP_VER),start=c(2005,2),frequency=4)
plot(plot_VER)
```




```
CV_YUC <- YUC[ ,1]
IPV_YUC <- YUC[ ,2]
GDP_YUC <- YUC[,5]
REM_YUC <- YUC[,4]
UNEMP_YUC <- YUC[,3]
INPC_SUB_YUC <- YUC[,6]
INPC_E_YUC <- YUC[,7]
M1_YUC <- YUC[,8]
CONF_YUC <- YUC[,9]
plot_YUC<-ts(cbind(CV_YUC,IPV_YUC,GDP_YUC,REM_YUC,UNEMP_YUC),start=c(2005,2),frequency=4)
plot(plot_YUC)
```




```
CV_ZAC <- ZAC[ ,1]
IPV_ZAC <- ZAC[ ,2]
GDP_ZAC <- ZAC[,5]
REM_ZAC <- ZAC[,4]
UNEMP_ZAC <- ZAC[,3]
INPC_SUB_ZAC <- ZAC[,6]
INPC_E_ZAC <- ZAC[,7]
M1_ZAC <- ZAC[,8]
CONF_ZAC <- ZAC[,9]
plot_ZAC<-ts(cbind(CV_ZAC,IPV_ZAC,GDP_ZAC,REM_ZAC,UNEMP_ZAC),start=c(2005,2),frequency=4)
plot(plot_ZAC)
```



4.2 Correlation

```
round(cor(plot_AGS),2)
```

```
##            CV_AGS IPV_AGS GDP_AGS REM_AGS UNEMP_AGS
## CV_AGS       1.00    0.14    0.01   -0.01      0.00
## IPV_AGS      0.14    1.00   -0.10    0.37      0.04
## GDP_AGS      0.01   -0.10    1.00   -0.08     -0.02
## REM_AGS     -0.01    0.37   -0.08    1.00     -0.16
## UNEMP_AGS    0.00    0.04   -0.02   -0.16      1.00
```

```
round(cor(plot_BC),2)
```

```
##           CV_BC IPV_BC GDP_BC REM_BC UNEMP_BC
## CV_BC      1.00  -0.28   0.01   0.10     0.00
## IPV_BC    -0.28   1.00  -0.01   0.35     0.01
## GDP_BC     0.01  -0.01   1.00  -0.16    -0.08
## REM_BC     0.10   0.35  -0.16   1.00    -0.08
## UNEMP_BC   0.00   0.01  -0.08  -0.08     1.00
```

```
round(cor(plot_BCS),2)
```

```
##           CV_BCS IPV_BCS GDP_BCS REM_BCS UNEMP_BCS
## CV_BCS      1.00   -0.12    0.08    0.03     -0.08
## IPV_BCS    -0.12    1.00    0.05    0.17     -0.01
## GDP_BCS     0.08    0.05    1.00    0.08     -0.11
## REM_BCS     0.03    0.17    0.08    1.00      0.15
## UNEMP_BCS  -0.08   -0.01   -0.11    0.15      1.00
```

```
round(cor(plot_CAMP),2)
```

```
##            CV_CAMP IPV_CAMP GDP_CAMP REM_CAMP UNEMP_CAMP
## CV_CAMP       1.00     0.15     0.02     0.17      -0.09
## IPV_CAMP      0.15     1.00     0.09     0.27       0.10
## GDP_CAMP      0.02     0.09     1.00    -0.05      -0.14
## REM_CAMP      0.17     0.27    -0.05     1.00       0.18
## UNEMP_CAMP   -0.09     0.10    -0.14     0.18       1.00
```

```
round(cor(plot_CHIS),2)
```

```
##            CV_CHIS IPV_CHIS GDP_CHIS REM_CHIS UNEMP_CHIS
## CV_CHIS       1.00    -0.15     0.14    -0.01       0.04
## IPV_CHIS     -0.15     1.00     0.02     0.35      -0.07
## GDP_CHIS      0.14     0.02     1.00     0.11       0.05
## REM_CHIS     -0.01     0.35     0.11     1.00      -0.01
## UNEMP_CHIS    0.04    -0.07     0.05    -0.01       1.00
```

```
round(cor(plot_CHIH),2)
```

```
##            CV_CHIH IPV_CHIH GDP_CHIH REM_CHIH UNEMP_CHIH
## CV_CHIH       1.00    -0.01    -0.09    -0.02       0.09
## IPV_CHIH     -0.01     1.00    -0.09     0.36       0.10
## GDP_CHIH     -0.09    -0.09     1.00    -0.20      -0.14
## REM_CHIH     -0.02     0.36    -0.20     1.00      -0.14
## UNEMP_CHIH    0.09     0.10    -0.14    -0.14       1.00
```

```
round(cor(plot_CDMX),2)
```

```
##            CV_CDMX IPV_CDMX GDP_CDMX REM_CDMX UNEMP_CDMX
## CV_CDMX       1.00    -0.42    -0.20     0.07       0.15
## IPV_CDMX     -0.42     1.00     0.22     0.06      -0.04
## GDP_CDMX     -0.20     0.22     1.00    -0.02      -0.11
## REM_CDMX      0.07     0.06    -0.02     1.00       0.30
## UNEMP_CDMX    0.15    -0.04    -0.11     0.30       1.00
```

```
round(cor(plot_COAH),2)
```

```
##            CV_COAH IPV_COAH GDP_COAH REM_COAH UNEMP_COAH
## CV_COAH       1.00     0.01     0.07     0.05      -0.04
## IPV_COAH      0.01     1.00    -0.02     0.17       0.19
## GDP_COAH      0.07    -0.02     1.00    -0.04      -0.20
## REM_COAH      0.05     0.17    -0.04     1.00      -0.17
## UNEMP_COAH   -0.04     0.19    -0.20    -0.17       1.00
```

```
round(cor(plot_COL),2)
```

```
##           CV_COL IPV_COL GDP_COL REM_COL UNEMP_COL
## CV_COL      1.00   -0.13    0.04    0.04      0.02
## IPV_COL    -0.13    1.00    0.18    0.15     -0.10
## GDP_COL     0.04    0.18    1.00    0.01     -0.18
## REM_COL     0.04    0.15    0.01    1.00     -0.15
## UNEMP_COL   0.02   -0.10   -0.18   -0.15      1.00
```

```
round(cor(plot_DGO),2)
```

```
##           CV_DGO IPV_DGO GDP_DGO REM_DGO UNEMP_DGO
## CV_DGO      1.00   -0.13    0.01   -0.06     -0.02
## IPV_DGO    -0.13    1.00   -0.05    0.30      0.21
## GDP_DGO     0.01   -0.05    1.00   -0.03      0.03
## REM_DGO    -0.06    0.30   -0.03    1.00     -0.24
## UNEMP_DGO  -0.02    0.21    0.03   -0.24      1.00
```

```
round(cor(plot_GTO),2)
```

```
##           CV_GTO IPV_GTO GDP_GTO REM_GTO UNEMP_GTO
## CV_GTO      1.00   -0.14    0.04    0.02      0.03
## IPV_GTO    -0.14    1.00   -0.07    0.36      0.10
## GDP_GTO     0.04   -0.07    1.00   -0.14     -0.08
## REM_GTO     0.02    0.36   -0.14    1.00     -0.13
## UNEMP_GTO   0.03    0.10   -0.08   -0.13      1.00
```

```
round(cor(plot_GRO),2)
```

```
##           CV_GRO IPV_GRO GDP_GRO REM_GRO UNEMP_GRO
## CV_GRO      1.00   -0.20    0.00   -0.15      0.03
## IPV_GRO    -0.20    1.00   -0.09    0.31     -0.05
## GDP_GRO     0.00   -0.09    1.00    0.13     -0.09
## REM_GRO    -0.15    0.31    0.13    1.00     -0.26
## UNEMP_GRO   0.03   -0.05   -0.09   -0.26      1.00
```

```
round(cor(plot_HGO),2)
```

```
##           CV_HGO IPV_HGO GDP_HGO REM_HGO UNEMP_HGO
## CV_HGO      1.00   -0.04   -0.11    0.11     -0.04
## IPV_HGO    -0.04    1.00   -0.05    0.25     -0.07
## GDP_HGO    -0.11   -0.05    1.00   -0.02     -0.24
## REM_HGO     0.11    0.25   -0.02    1.00     -0.10
## UNEMP_HGO  -0.04   -0.07   -0.24   -0.10      1.00
```

```
round(cor(plot_JAL),2)
```

```
##           CV_JAL IPV_JAL GDP_JAL REM_JAL UNEMP_JAL
## CV_JAL      1.00   -0.29   -0.02   -0.05      0.03
```

```
## IPV_JAL    -0.29    1.00   -0.13    0.23      0.03
## GDP_JAL    -0.02   -0.13    1.00   -0.01     -0.18
## REM_JAL    -0.05    0.23   -0.01    1.00     -0.14
## UNEMP_JAL   0.03    0.03   -0.18   -0.14      1.00
```

```
round(cor(plot_MEX),2)
```

```
##           CV_MEX IPV_MEX GDP_MEX REM_MEX UNEMP_MEX
## CV_MEX      1.00   -0.11    0.02    0.02      0.15
## IPV_MEX    -0.11    1.00   -0.05    0.45      0.03
## GDP_MEX     0.02   -0.05    1.00    0.22     -0.17
## REM_MEX     0.02    0.45    0.22    1.00     -0.11
## UNEMP_MEX   0.15    0.03   -0.17   -0.11      1.00
```

```
round(cor(plot_MICH),2)
```

```
##            CV_MICH IPV_MICH GDP_MICH REM_MICH UNEMP_MICH
## CV_MICH       1.00    -0.24    -0.14    -0.03      -0.01
## IPV_MICH     -0.24     1.00    -0.01     0.32       0.10
## GDP_MICH     -0.14    -0.01     1.00    -0.01       0.03
## REM_MICH     -0.03     0.32    -0.01     1.00       0.00
## UNEMP_MICH   -0.01     0.10     0.03     0.00       1.00
```

```
round(cor(plot_MOR),2)
```

```
##           CV_MOR IPV_MOR GDP_MOR REM_MOR UNEMP_MOR
## CV_MOR      1.00   -0.18   -0.06    0.08      0.03
## IPV_MOR    -0.18    1.00   -0.03    0.35     -0.04
## GDP_MOR    -0.06   -0.03    1.00    0.05     -0.04
## REM_MOR     0.08    0.35    0.05    1.00      0.04
## UNEMP_MOR   0.03   -0.04   -0.04    0.04      1.00
```

```
round(cor(plot_NAY),2)
```

```
##           CV_NAY IPV_NAY GDP_NAY REM_NAY UNEMP_NAY
## CV_NAY      1.00   -0.08   -0.06    0.04      0.19
## IPV_NAY    -0.08    1.00    0.00    0.28      0.14
## GDP_NAY    -0.06    0.00    1.00    0.05      0.00
## REM_NAY     0.04    0.28    0.05    1.00      0.29
## UNEMP_NAY   0.19    0.14    0.00    0.29      1.00
```

```
round(cor(plot_NL),2)
```

```
##          CV_NL IPV_NL GDP_NL REM_NL UNEMP_NL
## CV_NL     1.00  -0.30   0.01  -0.14    -0.02
## IPV_NL   -0.30   1.00   0.00   0.22     0.16
## GDP_NL    0.01   0.00   1.00   0.09    -0.20
## REM_NL   -0.14   0.22   0.09   1.00     0.06
## UNEMP_NL -0.02   0.16  -0.20   0.06     1.00
```

```
round(cor(plot_OAXACA),2)
```

```
##              CV_OAXACA IPV_OAXACA GDP_OAXACA REM_OAXACA UNEMP_OAXACA
## CV_OAXACA         1.00      -0.09       0.03       0.01        -0.04
## IPV_OAXACA       -0.09       1.00       0.08       0.32         0.05
## GDP_OAXACA        0.03       0.08       1.00       0.22        -0.03
## REM_OAXACA        0.01       0.32       0.22       1.00        -0.23
## UNEMP_OAXACA     -0.04       0.05      -0.03      -0.23         1.00
```

```
round(cor(plot_PUE),2)
```

```
##           CV_PUE IPV_PUE GDP_PUE REM_PUE UNEMP_PUE
## CV_PUE      1.00   -0.10    0.06    0.11      0.17
## IPV_PUE    -0.10    1.00   -0.08    0.29      0.12
## GDP_PUE     0.06   -0.08    1.00    0.38     -0.14
## REM_PUE     0.11    0.29    0.38    1.00     -0.07
## UNEMP_PUE   0.17    0.12   -0.14   -0.07      1.00
```

```
round(cor(plot_QRO),2)
```

```
##           CV_QRO IPV_QRO GDP_QRO REM_QRO UNEMP_QRO
## CV_QRO      1.00   -0.18    0.05   -0.04      0.02
## IPV_QRO    -0.18    1.00   -0.04    0.32      0.02
## GDP_QRO     0.05   -0.04    1.00    0.00     -0.21
## REM_QRO    -0.04    0.32    0.00    1.00      0.26
## UNEMP_QRO   0.02    0.02   -0.21    0.26      1.00
```

```
round(cor(plot_Q_ROO),2)
```

```
##             CV_Q_ROO IPV_Q_ROO GDP_Q_ROO REM_Q_ROO UNEMP_Q_ROO
## CV_Q_ROO        1.00     -0.31      0.01      0.04       -0.05
## IPV_Q_ROO      -0.31      1.00      0.07      0.08       -0.01
## GDP_Q_ROO       0.01      0.07      1.00      0.32       -0.50
## REM_Q_ROO       0.04      0.08      0.32      1.00        0.26
## UNEMP_Q_ROO    -0.05     -0.01     -0.50      0.26        1.00
```

```
round(cor(plot_SLP),2)
```

```
##           CV_SLP IPV_SLP GDP_SLP REM_SLP UNEMP_SLP
## CV_SLP      1.00   -0.10   -0.01    0.04      0.03
## IPV_SLP    -0.10    1.00   -0.02    0.41      0.14
## GDP_SLP    -0.01   -0.02    1.00   -0.04     -0.02
## REM_SLP     0.04    0.41   -0.04    1.00      0.05
## UNEMP_SLP   0.03    0.14   -0.02    0.05      1.00
```

```
round(cor(plot_SIN),2)
```

```
##           CV_SIN IPV_SIN GDP_SIN REM_SIN UNEMP_SIN
## CV_SIN      1.00   -0.03    0.04    0.08      0.06
```

```
## IPV_SIN    -0.03    1.00   -0.03    0.32      0.19
## GDP_SIN     0.04   -0.03    1.00   -0.21      0.05
## REM_SIN     0.08    0.32   -0.21    1.00     -0.01
## UNEMP_SIN   0.06    0.19    0.05   -0.01      1.00
```

```
round(cor(plot_SON),2)
```

```
##           CV_SON IPV_SON GDP_SON REM_SON UNEMP_SON
## CV_SON      1.00    0.01    0.06    0.08      0.10
## IPV_SON     0.01    1.00   -0.07    0.37      0.03
## GDP_SON     0.06   -0.07    1.00   -0.18     -0.06
## REM_SON     0.08    0.37   -0.18    1.00     -0.10
## UNEMP_SON   0.10    0.03   -0.06   -0.10      1.00
```

```
round(cor(plot_TAB),2)
```

```
##           CV_TAB IPV_TAB GDP_TAB REM_TAB UNEMP_TAB
## CV_TAB      1.00   -0.13    0.21   -0.06     -0.12
## IPV_TAB    -0.13    1.00   -0.10    0.29      0.00
## GDP_TAB     0.21   -0.10    1.00    0.00     -0.15
## REM_TAB    -0.06    0.29    0.00    1.00     -0.19
## UNEMP_TAB  -0.12    0.00   -0.15   -0.19      1.00
```

```
round(cor(plot_TAMPS),2)
```

```
##             CV_TAMPS IPV_TAMPS GDP_TAMPS REM_TAMPS UNEMP_TAMPS
## CV_TAMPS        1.00      0.01     -0.05      0.00       -0.04
## IPV_TAMPS       0.01      1.00      0.07      0.21        0.17
## GDP_TAMPS      -0.05      0.07      1.00      0.02       -0.07
## REM_TAMPS       0.00      0.21      0.02      1.00       -0.07
## UNEMP_TAMPS    -0.04      0.17     -0.07     -0.07        1.00
```

```
round(cor(plot_TLAX),2)
```

```
##            CV_TLAX IPV_TLAX GDP_TLAX REM_TLAX UNEMP_TLAX
## CV_TLAX       1.00     0.04    -0.03     0.00       0.03
## IPV_TLAX      0.04     1.00    -0.05     0.26       0.25
## GDP_TLAX     -0.03    -0.05     1.00     0.14      -0.25
## REM_TLAX      0.00     0.26     0.14     1.00      -0.03
## UNEMP_TLAX    0.03     0.25    -0.25    -0.03       1.00
```

```
round(cor(plot_VER),2)
```

```
##           CV_VER IPV_VER GDP_VER REM_VER UNEMP_VER
## CV_VER      1.00    0.00   -0.13    0.15      0.02
## IPV_VER     0.00    1.00    0.05    0.26     -0.12
## GDP_VER    -0.13    0.05    1.00    0.01     -0.03
## REM_VER     0.15    0.26    0.01    1.00     -0.16
## UNEMP_VER   0.02   -0.12   -0.03   -0.16      1.00
```

```
round(cor(plot_YUC),2)
```

```
##           CV_YUC IPV_YUC GDP_YUC REM_YUC UNEMP_YUC
## CV_YUC      1.00   -0.06   -0.04    0.06      0.14
## IPV_YUC    -0.06    1.00   -0.07    0.15      0.13
## GDP_YUC    -0.04   -0.07    1.00    0.56     -0.14
## REM_YUC     0.06    0.15    0.56    1.00     -0.06
## UNEMP_YUC   0.14    0.13   -0.14   -0.06      1.00
```

```
round(cor(plot_ZAC),2)
```

```
##           CV_ZAC IPV_ZAC GDP_ZAC REM_ZAC UNEMP_ZAC
## CV_ZAC      1.00   -0.13    0.12    0.01      0.07
## IPV_ZAC    -0.13    1.00   -0.07    0.34      0.01
## GDP_ZAC     0.12   -0.07    1.00   -0.02      0.02
## REM_ZAC     0.01    0.34   -0.02    1.00     -0.29
## UNEMP_ZAC   0.07    0.01    0.02   -0.29      1.00
```

4.3 Data Analysis

4.3.1 Delincquency rates by State

```
library("ellipsis")
```

```
## Warning: package 'ellipsis' was built under R version 4.0.2
```

```
library("cli")
```

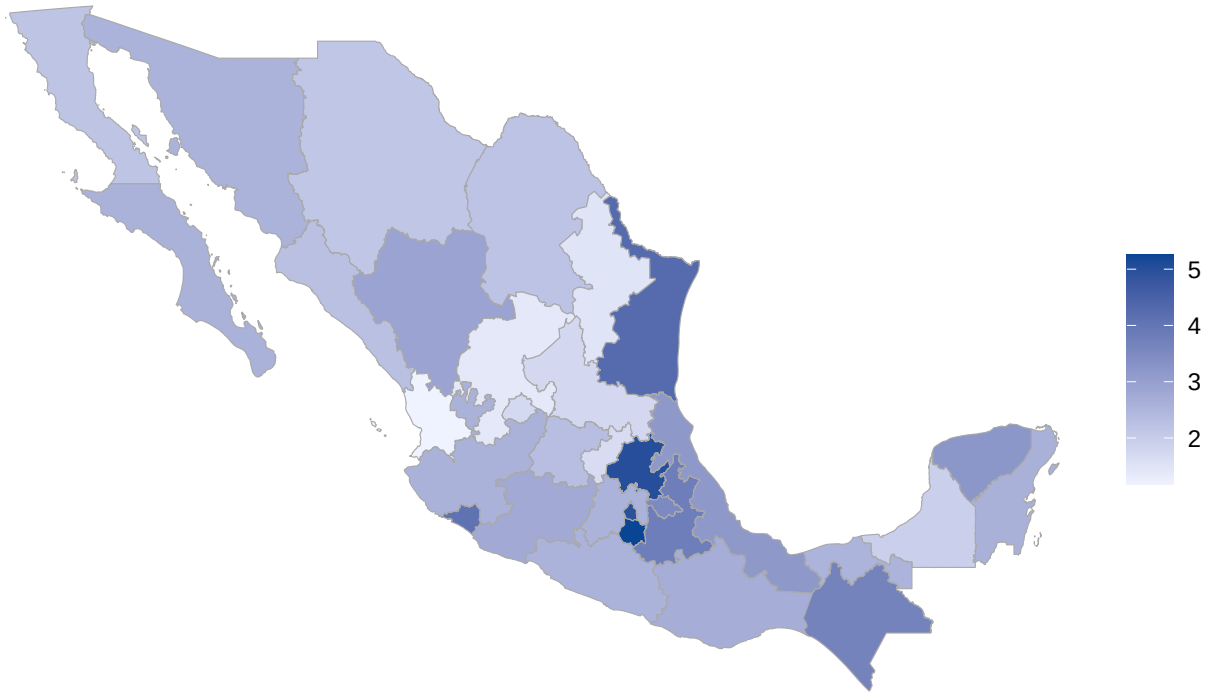
```
## Warning: package 'cli' was built under R version 4.0.2
```

```
library("devtools")
```

```
## Warning: package 'devtools' was built under R version 4.0.2
```

```
library("mxmaps")

CV_STATES<-cbind(CV_AGS,CV_BC,CV_BCS,CV_CAMP,CV_CDMX,CV_CHIH,CV_CHIS,CV_COAH,CV_COL,CV_DGO,CV_GRO,CV_GT

KEY<-c(01,  02, 03, 04, 09, 08, 07, 05, 06, 10, 12, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 22, 25,

CV_2020<-CV_STATES[60:63,]

CV_2020_MEAN<-c(mean(CV_2020[,1]),mean(CV_2020[,2]),mean(CV_2020[,3]),mean(CV_2020[,4]),mean(CV_2020[,5

MAPCV2020<-as.data.frame(t(rbind(CV_2020_MEAN,KEY)))
colnames(MAPCV2020)<-c("value","region")

MAP <- mxstate_choropleth(MAPCV2020, num_colors=1, title="Average delincquency rate by state (2020)")
MAP
```

Average delincquency rate by state (2020)



5 Stationarity

(development of state level models is still pending)

6 Estimating lags NACIONAL

```
# AGS
# IPV - AGS
IPV_AGS_v<-as.vector(IPV_AGS)
CV_AGS_v<-as.vector(CV_AGS)
IPV_AGS_v2<-cbind(IPV_AGS_v,CV_AGS_v)
colnames(IPV_AGS_v2)<-c("IPV_AGS","CV_AGS")
a<- lag(IPV_AGS_v,0)
x<- lag(IPV_AGS_v,1)
y<- lag(IPV_AGS_v,2)
z<- lag(IPV_AGS_v,3)
IPV_AGS_lags <- cbind(x,y,z)

fitIPV_AGS1 <- auto.arima(IPV_AGS_v2[4: 63,2], xreg=IPV_AGS_lags[4: 63,1], d=0)
fitIPV_AGS2 <- auto.arima(IPV_AGS_v2[4: 63,2], xreg=IPV_AGS_lags[4: 63,1:2], d=0)
fitIPV_AGS3 <- auto.arima(IPV_AGS_v2[4: 63,2], xreg=IPV_AGS_lags[4: 63,1:3], d=0)
AIC_IPV_AGS <- cbind(fitIPV_AGS1$aic,fitIPV_AGS2$aic,fitIPV_AGS3$aic)
```

```
colnames(AIC_IPV_AGS)<-c("1 lag","2 lags", "3 lags")
# UNEMP - AGS
UNEMP_AGS_v<-as.vector(UNEMP_AGS)
CV_AGS_v<-as.vector(CV_AGS)
UNEMP_AGS_v2<-cbind(UNEMP_AGS_v,CV_AGS_v)
colnames(UNEMP_AGS_v2)<-c("UNEMP_AGS","CV_AGS")
a<- lag(UNEMP_AGS_v,0)
x<- lag(UNEMP_AGS_v,1)
y<- lag(UNEMP_AGS_v,2)
z<- lag(UNEMP_AGS_v,3)
UNEMP_AGS_lags <- cbind(x,y,z)

fitUNEMP_AGS1 <- auto.arima(UNEMP_AGS_v2[4: 63,2], xreg=UNEMP_AGS_lags[4: 63,1], d=0)
fitUNEMP_AGS2 <- auto.arima(UNEMP_AGS_v2[4: 63,2], xreg=UNEMP_AGS_lags[4: 63,1:2], d=0)
fitUNEMP_AGS3 <- auto.arima(UNEMP_AGS_v2[4: 63,2], xreg=UNEMP_AGS_lags[4: 63,1:3], d=0)
AIC_UNEMP_AGS <- cbind(fitUNEMP_AGS1$aic,fitUNEMP_AGS2$aic,fitUNEMP_AGS3$aic)
colnames(AIC_UNEMP_AGS)<-c("1 lag","2 lags", "3 lags")
# REM - AGS
REM_AGS_v<-as.vector(REM_AGS)
CV_AGS_v<-as.vector(CV_AGS)
REM_AGS_v2<-cbind(REM_AGS_v,CV_AGS_v)
colnames(REM_AGS_v2)<-c("REM_AGS","CV_AGS")
a<- lag(REM_AGS_v,0)
x<- lag(REM_AGS_v,1)
y<- lag(REM_AGS_v,2)
z<- lag(REM_AGS_v,3)
REM_AGS_lags <- cbind(x,y,z)

fitREM_AGS1 <- auto.arima(REM_AGS_v2[4: 63,2], xreg=REM_AGS_lags[4: 63,1], d=0)
fitREM_AGS2 <- auto.arima(REM_AGS_v2[4: 63,2], xreg=REM_AGS_lags[4: 63,1:2], d=0)
fitREM_AGS3 <- auto.arima(REM_AGS_v2[4: 63,2], xreg=REM_AGS_lags[4: 63,1:3], d=0)
AIC_REM_AGS <- cbind(fitREM_AGS1$aic,fitREM_AGS2$aic,fitREM_AGS3$aic)
colnames(AIC_REM_AGS)<-c("1 lag","2 lags", "3 lags")
# GDP - AGS
GDP_AGS_v<-as.vector(GDP_AGS)
CV_AGS_v<-as.vector(CV_AGS)
GDP_AGS_v2<-cbind(GDP_AGS_v,CV_AGS_v)
colnames(GDP_AGS_v2)<-c("GDP_AGS","CV_AGS")
a<- lag(GDP_AGS_v,0)
x<- lag(GDP_AGS_v,1)
y<- lag(GDP_AGS_v,2)
z<- lag(GDP_AGS_v,3)
GDP_AGS_lags <- cbind(x,y,z)

fitGDP_AGS1 <- auto.arima(GDP_AGS_v2[4: 63,2], xreg=GDP_AGS_lags[4: 63,1], d=0)
fitGDP_AGS2 <- auto.arima(GDP_AGS_v2[4: 63,2], xreg=GDP_AGS_lags[4: 63,1:2], d=0)
fitGDP_AGS3 <- auto.arima(GDP_AGS_v2[4: 63,2], xreg=GDP_AGS_lags[4: 63,1:3], d=0)
AIC_GDP_AGS <- cbind(fitGDP_AGS1$aic,fitGDP_AGS2$aic,fitGDP_AGS3$aic)
colnames(AIC_GDP_AGS)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - AGS
INPC_SUB_AGS_v<-as.vector(INPC_SUB_AGS)
CV_AGS_v<-as.vector(CV_AGS)
INPC_SUB_AGS_v2<-cbind(INPC_SUB_AGS_v,CV_AGS_v)
```

```
colnames(INPC_SUB_AGS_v2)<-c("INPC_SUB_AGS","CV_AGS")
a<- lag(INPC_SUB_AGS_v,0)
x<- lag(INPC_SUB_AGS_v,1)
y<- lag(INPC_SUB_AGS_v,2)
z<- lag(INPC_SUB_AGS_v,3)
INPC_SUB_AGS_lags <- cbind(x,y,z)

fitINPC_SUB_AGS1 <- auto.arima(INPC_SUB_AGS_v2[4: 63,2], xreg=INPC_SUB_AGS_lags[4: 63,1], d=0)
fitINPC_SUB_AGS2 <- auto.arima(INPC_SUB_AGS_v2[4: 63,2], xreg=INPC_SUB_AGS_lags[4: 63,1:2], d=0)
fitINPC_SUB_AGS3 <- auto.arima(INPC_SUB_AGS_v2[4: 63,2], xreg=INPC_SUB_AGS_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_AGS <- cbind(fitINPC_SUB_AGS1$aic,fitINPC_SUB_AGS2$aic,fitINPC_SUB_AGS3$aic)
colnames(AIC_INPC_SUB_AGS)<-c("1 lag","2 lags", "3 lags")
# INPC_E - AGS
INPC_E_AGS_v<-as.vector(INPC_E_AGS)
CV_AGS_v<-as.vector(CV_AGS)
INPC_E_AGS_v2<-cbind(INPC_E_AGS_v,CV_AGS_v)
colnames(INPC_E_AGS_v2)<-c("INPC_E_AGS","CV_AGS")
a<- lag(INPC_E_AGS_v,0)
x<- lag(INPC_E_AGS_v,1)
y<- lag(INPC_E_AGS_v,2)
z<- lag(INPC_E_AGS_v,3)
INPC_E_AGS_lags <- cbind(x,y,z)

fitINPC_E_AGS1 <- auto.arima(INPC_E_AGS_v2[4: 63,2], xreg=INPC_E_AGS_lags[4: 63,1], d=0)
fitINPC_E_AGS2 <- auto.arima(INPC_E_AGS_v2[4: 63,2], xreg=INPC_E_AGS_lags[4: 63,1:2], d=0)
fitINPC_E_AGS3 <- auto.arima(INPC_E_AGS_v2[4: 63,2], xreg=INPC_E_AGS_lags[4: 63,1:3], d=0)
AIC_INPC_E_AGS <- cbind(fitINPC_E_AGS1$aic,fitINPC_E_AGS2$aic,fitINPC_E_AGS3$aic)
colnames(AIC_INPC_E_AGS)<-c("1 lag","2 lags", "3 lags")
# M1 - AGS
M1_AGS_v<-as.vector(M1_AGS)
CV_AGS_v<-as.vector(CV_AGS)
M1_AGS_v2<-cbind(M1_AGS_v,CV_AGS_v)
colnames(M1_AGS_v2)<-c("M1_AGS","CV_AGS")
a<- lag(M1_AGS_v,0)
x<- lag(M1_AGS_v,1)
y<- lag(M1_AGS_v,2)
z<- lag(M1_AGS_v,3)
M1_AGS_lags <- cbind(x,y,z)

fitM1_AGS1 <- auto.arima(M1_AGS_v2[4: 63,2], xreg=M1_AGS_lags[4: 63,1], d=0)
fitM1_AGS2 <- auto.arima(M1_AGS_v2[4: 63,2], xreg=M1_AGS_lags[4: 63,1:2], d=0)
fitM1_AGS3 <- auto.arima(M1_AGS_v2[4: 63,2], xreg=M1_AGS_lags[4: 63,1:3], d=0)
AIC_M1_AGS <- cbind(fitM1_AGS1$aic,fitM1_AGS2$aic,fitM1_AGS3$aic)
colnames(AIC_M1_AGS)<-c("1 lag","2 lags", "3 lags")
# CONF - AGS
CONF_AGS_v<-as.vector(CONF_AGS)
CV_AGS_v<-as.vector(CV_AGS)
CONF_AGS_v2<-cbind(CONF_AGS_v,CV_AGS_v)
colnames(CONF_AGS_v2)<-c("CONF_AGS","CV_AGS")
a<- lag(CONF_AGS_v,0)
x<- lag(CONF_AGS_v,1)
y<- lag(CONF_AGS_v,2)
z<- lag(CONF_AGS_v,3)
```

```
CONF_AGS_lags <- cbind(x,y,z)

fitCONF_AGS1 <- auto.arima(CONF_AGS_v2[4: 63,2], xreg=CONF_AGS_lags[4: 63,1], d=0)
fitCONF_AGS2 <- auto.arima(CONF_AGS_v2[4: 63,2], xreg=CONF_AGS_lags[4: 63,1:2], d=0)
fitCONF_AGS3 <- auto.arima(CONF_AGS_v2[4: 63,2], xreg=CONF_AGS_lags[4: 63,1:3], d=0)
AIC_CONF_AGS <- cbind(fitCONF_AGS1$aic,fitCONF_AGS2$aic,fitCONF_AGS3$aic)
colnames(AIC_CONF_AGS)<-c("1 lag","2 lags", "3 lags")

AICs_AGS<-rbind(AIC_IPV_AGS,AIC_UNEMP_AGS,AIC_REM_AGS,AIC_GDP_AGS,AIC_INPC_SUB_AGS,AIC_INPC_E_AGS,AIC_M
rownames(AICs_AGS)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_AGS
```

```
##              1 lag   2 lags   3 lags
## IPV       404.3509 418.9198 420.2026
## DESEMPLEO 417.8817 419.7863 409.2850
## REMESAS   417.1398 418.4476 417.4228
## PIB       404.1333 419.4390 417.5082
## INPC_SUB  403.8960 419.3705 420.1818
## INPC_E    402.5857 404.3525 421.1459
## M1        414.6592 416.3267 418.2278
## CONF      404.3116 419.4537 421.3845
```

```
# BC
# IPV - BC
IPV_BC_v<-as.vector(IPV_BC)
CV_BC_v<-as.vector(CV_BC)
IPV_BC_v2<-cbind(IPV_BC_v,CV_BC_v)
colnames(IPV_BC_v2)<-c("IPV_BC","CV_BC")
a<- lag(IPV_BC_v,0)
x<- lag(IPV_BC_v,1)
y<- lag(IPV_BC_v,2)
z<- lag(IPV_BC_v,3)
IPV_BC_lags <- cbind(x,y,z)

fitIPV_BC1 <- auto.arima(IPV_BC_v2[4: 63,2], xreg=IPV_BC_lags[4: 63,1], d=0)
fitIPV_BC2 <- auto.arima(IPV_BC_v2[4: 63,2], xreg=IPV_BC_lags[4: 63,1:2], d=0)
fitIPV_BC3 <- auto.arima(IPV_BC_v2[4: 63,2], xreg=IPV_BC_lags[4: 63,1:3], d=0)
AIC_IPV_BC <- cbind(fitIPV_BC1$aic,fitIPV_BC2$aic,fitIPV_BC3$aic)
colnames(AIC_IPV_BC)<-c("1 lag","2 lags", "3 lags")
# UNEMP - BC
UNEMP_BC_v<-as.vector(UNEMP_BC)
CV_BC_v<-as.vector(CV_BC)
UNEMP_BC_v2<-cbind(UNEMP_BC_v,CV_BC_v)
colnames(UNEMP_BC_v2)<-c("UNEMP_BC","CV_BC")
a<- lag(UNEMP_BC_v,0)
x<- lag(UNEMP_BC_v,1)
y<- lag(UNEMP_BC_v,2)
z<- lag(UNEMP_BC_v,3)
UNEMP_BC_lags <- cbind(x,y,z)

fitUNEMP_BC1 <- auto.arima(UNEMP_BC_v2[4: 63,2], xreg=UNEMP_BC_lags[4: 63,1], d=0)
fitUNEMP_BC2 <- auto.arima(UNEMP_BC_v2[4: 63,2], xreg=UNEMP_BC_lags[4: 63,1:2], d=0)
fitUNEMP_BC3 <- auto.arima(UNEMP_BC_v2[4: 63,2], xreg=UNEMP_BC_lags[4: 63,1:3], d=0)
```

```
AIC_UNEMP_BC <- cbind(fitUNEMP_BC1$aic,fitUNEMP_BC2$aic,fitUNEMP_BC3$aic)
colnames(AIC_UNEMP_BC)<-c("1 lag","2 lags", "3 lags")
# REM - BC
REM_BC_v<-as.vector(REM_BC)
CV_BC_v<-as.vector(CV_BC)
REM_BC_v2<-cbind(REM_BC_v,CV_BC_v)
colnames(REM_BC_v2)<-c("REM_BC","CV_BC")
a<- lag(REM_BC_v,0)
x<- lag(REM_BC_v,1)
y<- lag(REM_BC_v,2)
z<- lag(REM_BC_v,3)
REM_BC_lags <- cbind(x,y,z)

fitREM_BC1 <- auto.arima(REM_BC_v2[4: 63,2], xreg=REM_BC_lags[4: 63,1], d=0)
fitREM_BC2 <- auto.arima(REM_BC_v2[4: 63,2], xreg=REM_BC_lags[4: 63,1:2], d=0)
fitREM_BC3 <- auto.arima(REM_BC_v2[4: 63,2], xreg=REM_BC_lags[4: 63,1:3], d=0)
AIC_REM_BC <- cbind(fitREM_BC1$aic,fitREM_BC2$aic,fitREM_BC3$aic)
colnames(AIC_REM_BC)<-c("1 lag","2 lags", "3 lags")
# GDP - BC
GDP_BC_v<-as.vector(GDP_BC)
CV_BC_v<-as.vector(CV_BC)
GDP_BC_v2<-cbind(GDP_BC_v,CV_BC_v)
colnames(GDP_BC_v2)<-c("GDP_BC","CV_BC")
a<- lag(GDP_BC_v,0)
x<- lag(GDP_BC_v,1)
y<- lag(GDP_BC_v,2)
z<- lag(GDP_BC_v,3)
GDP_BC_lags <- cbind(x,y,z)

fitGDP_BC1 <- auto.arima(GDP_BC_v2[4: 63,2], xreg=GDP_BC_lags[4: 63,1], d=0)
fitGDP_BC2 <- auto.arima(GDP_BC_v2[4: 63,2], xreg=GDP_BC_lags[4: 63,1:2], d=0)
fitGDP_BC3 <- auto.arima(GDP_BC_v2[4: 63,2], xreg=GDP_BC_lags[4: 63,1:3], d=0)
AIC_GDP_BC <- cbind(fitGDP_BC1$aic,fitGDP_BC2$aic,fitGDP_BC3$aic)
colnames(AIC_GDP_BC)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - BC
INPC_SUB_BC_v<-as.vector(INPC_SUB_BC)
CV_BC_v<-as.vector(CV_BC)
INPC_SUB_BC_v2<-cbind(INPC_SUB_BC_v,CV_BC_v)
colnames(INPC_SUB_BC_v2)<-c("INPC_SUB_BC","CV_BC")
a<- lag(INPC_SUB_BC_v,0)
x<- lag(INPC_SUB_BC_v,1)
y<- lag(INPC_SUB_BC_v,2)
z<- lag(INPC_SUB_BC_v,3)
INPC_SUB_BC_lags <- cbind(x,y,z)

fitINPC_SUB_BC1 <- auto.arima(INPC_SUB_BC_v2[4: 63,2], xreg=INPC_SUB_BC_lags[4: 63,1], d=0)
fitINPC_SUB_BC2 <- auto.arima(INPC_SUB_BC_v2[4: 63,2], xreg=INPC_SUB_BC_lags[4: 63,1:2], d=0)
fitINPC_SUB_BC3 <- auto.arima(INPC_SUB_BC_v2[4: 63,2], xreg=INPC_SUB_BC_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_BC <- cbind(fitINPC_SUB_BC1$aic,fitINPC_SUB_BC2$aic,fitINPC_SUB_BC3$aic)
colnames(AIC_INPC_SUB_BC)<-c("1 lag","2 lags", "3 lags")
# INPC_E - BC
INPC_E_BC_v<-as.vector(INPC_E_BC)
CV_BC_v<-as.vector(CV_BC)
```

```
INPC_E_BC_v2<-cbind(INPC_E_BC_v,CV_BC_v)
colnames(INPC_E_BC_v2)<-c("INPC_E_BC","CV_BC")
a<- lag(INPC_E_BC_v,0)
x<- lag(INPC_E_BC_v,1)
y<- lag(INPC_E_BC_v,2)
z<- lag(INPC_E_BC_v,3)
INPC_E_BC_lags <- cbind(x,y,z)

fitINPC_E_BC1 <- auto.arima(INPC_E_BC_v2[4: 63,2], xreg=INPC_E_BC_lags[4: 63,1], d=0)
fitINPC_E_BC2 <- auto.arima(INPC_E_BC_v2[4: 63,2], xreg=INPC_E_BC_lags[4: 63,1:2], d=0)
fitINPC_E_BC3 <- auto.arima(INPC_E_BC_v2[4: 63,2], xreg=INPC_E_BC_lags[4: 63,1:3], d=0)
AIC_INPC_E_BC <- cbind(fitINPC_E_BC1$aic,fitINPC_E_BC2$aic,fitINPC_E_BC3$aic)
colnames(AIC_INPC_E_BC)<-c("1 lag","2 lags", "3 lags")
# M1 - BC
M1_BC_v<-as.vector(M1_BC)
CV_BC_v<-as.vector(CV_BC)
M1_BC_v2<-cbind(M1_BC_v,CV_BC_v)
colnames(M1_BC_v2)<-c("M1_BC","CV_BC")
a<- lag(M1_BC_v,0)
x<- lag(M1_BC_v,1)
y<- lag(M1_BC_v,2)
z<- lag(M1_BC_v,3)
M1_BC_lags <- cbind(x,y,z)

fitM1_BC1 <- auto.arima(M1_BC_v2[4: 63,2], xreg=M1_BC_lags[4: 63,1], d=0)
fitM1_BC2 <- auto.arima(M1_BC_v2[4: 63,2], xreg=M1_BC_lags[4: 63,1:2], d=0)
fitM1_BC3 <- auto.arima(M1_BC_v2[4: 63,2], xreg=M1_BC_lags[4: 63,1:3], d=0)
AIC_M1_BC <- cbind(fitM1_BC1$aic,fitM1_BC2$aic,fitM1_BC3$aic)
colnames(AIC_M1_BC)<-c("1 lag","2 lags", "3 lags")
# CONF - BC
CONF_BC_v<-as.vector(CONF_BC)
CV_BC_v<-as.vector(CV_BC)
CONF_BC_v2<-cbind(CONF_BC_v,CV_BC_v)
colnames(CONF_BC_v2)<-c("CONF_BC","CV_BC")
a<- lag(CONF_BC_v,0)
x<- lag(CONF_BC_v,1)
y<- lag(CONF_BC_v,2)
z<- lag(CONF_BC_v,3)
CONF_BC_lags <- cbind(x,y,z)

fitCONF_BC1 <- auto.arima(CONF_BC_v2[4: 63,2], xreg=CONF_BC_lags[4: 63,1], d=0)
fitCONF_BC2 <- auto.arima(CONF_BC_v2[4: 63,2], xreg=CONF_BC_lags[4: 63,1:2], d=0)
fitCONF_BC3 <- auto.arima(CONF_BC_v2[4: 63,2], xreg=CONF_BC_lags[4: 63,1:3], d=0)
AIC_CONF_BC <- cbind(fitCONF_BC1$aic,fitCONF_BC2$aic,fitCONF_BC3$aic)
colnames(AIC_CONF_BC)<-c("1 lag","2 lags", "3 lags")

AICs_BC<-rbind(AIC_IPV_BC,AIC_UNEMP_BC,AIC_REM_BC,AIC_GDP_BC,AIC_INPC_SUB_BC,AIC_INPC_E_BC,AIC_M1_BC,AI
rownames(AICs_BC)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_BC
```

```
##              1 lag   2 lags   3 lags
## IPV       61.00401 63.00076 64.36807
## DESEMPLEO 59.31299 57.03908 58.25512
```

```
## REMESAS   60.22026 61.61349 62.93746
## PIB       61.18061 62.93661 63.92991
## INPC_SUB  61.13115 62.00703 63.95717
## INPC_E    61.18627 62.94544 64.82929
## M1        60.99612 62.91478 64.28361
## CONF      61.16909 63.12700 64.05885
```

```
# BCS
# IPV - BCS
IPV_BCS_v<-as.vector(IPV_BCS)
CV_BCS_v<-as.vector(CV_BCS)
IPV_BCS_v2<-cbind(IPV_BCS_v,CV_BCS_v)
colnames(IPV_BCS_v2)<-c("IPV_BCS","CV_BCS")
a<- lag(IPV_BCS_v,0)
x<- lag(IPV_BCS_v,1)
y<- lag(IPV_BCS_v,2)
z<- lag(IPV_BCS_v,3)
IPV_BCS_lags <- cbind(x,y,z)

fitIPV_BCS1 <- auto.arima(IPV_BCS_v2[4: 63,2], xreg=IPV_BCS_lags[4: 63,1], d=0)
fitIPV_BCS2 <- auto.arima(IPV_BCS_v2[4: 63,2], xreg=IPV_BCS_lags[4: 63,1:2], d=0)
fitIPV_BCS3 <- auto.arima(IPV_BCS_v2[4: 63,2], xreg=IPV_BCS_lags[4: 63,1:3], d=0)
AIC_IPV_BCS <- cbind(fitIPV_BCS1$aic,fitIPV_BCS2$aic,fitIPV_BCS3$aic)
colnames(AIC_IPV_BCS)<-c("1 lag","2 lags", "3 lags")
# UNEMP - BCS
UNEMP_BCS_v<-as.vector(UNEMP_BCS)
CV_BCS_v<-as.vector(CV_BCS)
UNEMP_BCS_v2<-cbind(UNEMP_BCS_v,CV_BCS_v)
colnames(UNEMP_BCS_v2)<-c("UNEMP_BCS","CV_BCS")
a<- lag(UNEMP_BCS_v,0)
x<- lag(UNEMP_BCS_v,1)
y<- lag(UNEMP_BCS_v,2)
z<- lag(UNEMP_BCS_v,3)
UNEMP_BCS_lags <- cbind(x,y,z)

fitUNEMP_BCS1 <- auto.arima(UNEMP_BCS_v2[4: 63,2], xreg=UNEMP_BCS_lags[4: 63,1], d=0)
fitUNEMP_BCS2 <- auto.arima(UNEMP_BCS_v2[4: 63,2], xreg=UNEMP_BCS_lags[4: 63,1:2], d=0)
fitUNEMP_BCS3 <- auto.arima(UNEMP_BCS_v2[4: 63,2], xreg=UNEMP_BCS_lags[4: 63,1:3], d=0)
AIC_UNEMP_BCS <- cbind(fitUNEMP_BCS1$aic,fitUNEMP_BCS2$aic,fitUNEMP_BCS3$aic)
colnames(AIC_UNEMP_BCS)<-c("1 lag","2 lags", "3 lags")
# REM - BCS
REM_BCS_v<-as.vector(REM_BCS)
CV_BCS_v<-as.vector(CV_BCS)
REM_BCS_v2<-cbind(REM_BCS_v,CV_BCS_v)
colnames(REM_BCS_v2)<-c("REM_BCS","CV_BCS")
a<- lag(REM_BCS_v,0)
x<- lag(REM_BCS_v,1)
y<- lag(REM_BCS_v,2)
z<- lag(REM_BCS_v,3)
REM_BCS_lags <- cbind(x,y,z)

fitREM_BCS1 <- auto.arima(REM_BCS_v2[4: 63,2], xreg=REM_BCS_lags[4: 63,1], d=0)
fitREM_BCS2 <- auto.arima(REM_BCS_v2[4: 63,2], xreg=REM_BCS_lags[4: 63,1:2], d=0)
fitREM_BCS3 <- auto.arima(REM_BCS_v2[4: 63,2], xreg=REM_BCS_lags[4: 63,1:3], d=0)
```

```
AIC_REM_BCS <- cbind(fitREM_BCS1$aic,fitREM_BCS2$aic,fitREM_BCS3$aic)
colnames(AIC_REM_BCS)<-c("1 lag","2 lags", "3 lags")
# GDP - BCS
GDP_BCS_v<-as.vector(GDP_BCS)
CV_BCS_v<-as.vector(CV_BCS)
GDP_BCS_v2<-cbind(GDP_BCS_v,CV_BCS_v)
colnames(GDP_BCS_v2)<-c("GDP_BCS","CV_BCS")
a<- lag(GDP_BCS_v,0)
x<- lag(GDP_BCS_v,1)
y<- lag(GDP_BCS_v,2)
z<- lag(GDP_BCS_v,3)
GDP_BCS_lags <- cbind(x,y,z)

fitGDP_BCS1 <- auto.arima(GDP_BCS_v2[4: 63,2], xreg=GDP_BCS_lags[4: 63,1], d=0)
fitGDP_BCS2 <- auto.arima(GDP_BCS_v2[4: 63,2], xreg=GDP_BCS_lags[4: 63,1:2], d=0)
fitGDP_BCS3 <- auto.arima(GDP_BCS_v2[4: 63,2], xreg=GDP_BCS_lags[4: 63,1:3], d=0)
AIC_GDP_BCS <- cbind(fitGDP_BCS1$aic,fitGDP_BCS2$aic,fitGDP_BCS3$aic)
colnames(AIC_GDP_BCS)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - BCS
INPC_SUB_BCS_v<-as.vector(INPC_SUB_BCS)
CV_BCS_v<-as.vector(CV_BCS)
INPC_SUB_BCS_v2<-cbind(INPC_SUB_BCS_v,CV_BCS_v)
colnames(INPC_SUB_BCS_v2)<-c("INPC_SUB_BCS","CV_BCS")
a<- lag(INPC_SUB_BCS_v,0)
x<- lag(INPC_SUB_BCS_v,1)
y<- lag(INPC_SUB_BCS_v,2)
z<- lag(INPC_SUB_BCS_v,3)
INPC_SUB_BCS_lags <- cbind(x,y,z)

fitINPC_SUB_BCS1 <- auto.arima(INPC_SUB_BCS_v2[4: 63,2], xreg=INPC_SUB_BCS_lags[4: 63,1], d=0)
fitINPC_SUB_BCS2 <- auto.arima(INPC_SUB_BCS_v2[4: 63,2], xreg=INPC_SUB_BCS_lags[4: 63,1:2], d=0)
fitINPC_SUB_BCS3 <- auto.arima(INPC_SUB_BCS_v2[4: 63,2], xreg=INPC_SUB_BCS_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_BCS <- cbind(fitINPC_SUB_BCS1$aic,fitINPC_SUB_BCS2$aic,fitINPC_SUB_BCS3$aic)
colnames(AIC_INPC_SUB_BCS)<-c("1 lag","2 lags", "3 lags")
# INPC_E - BCS
INPC_E_BCS_v<-as.vector(INPC_E_BCS)
CV_BCS_v<-as.vector(CV_BCS)
INPC_E_BCS_v2<-cbind(INPC_E_BCS_v,CV_BCS_v)
colnames(INPC_E_BCS_v2)<-c("INPC_E_BCS","CV_BCS")
a<- lag(INPC_E_BCS_v,0)
x<- lag(INPC_E_BCS_v,1)
y<- lag(INPC_E_BCS_v,2)
z<- lag(INPC_E_BCS_v,3)
INPC_E_BCS_lags <- cbind(x,y,z)

fitINPC_E_BCS1 <- auto.arima(INPC_E_BCS_v2[4: 63,2], xreg=INPC_E_BCS_lags[4: 63,1], d=0)
fitINPC_E_BCS2 <- auto.arima(INPC_E_BCS_v2[4: 63,2], xreg=INPC_E_BCS_lags[4: 63,1:2], d=0)
fitINPC_E_BCS3 <- auto.arima(INPC_E_BCS_v2[4: 63,2], xreg=INPC_E_BCS_lags[4: 63,1:3], d=0)
AIC_INPC_E_BCS <- cbind(fitINPC_E_BCS1$aic,fitINPC_E_BCS2$aic,fitINPC_E_BCS3$aic)
colnames(AIC_INPC_E_BCS)<-c("1 lag","2 lags", "3 lags")
# M1 - BCS
M1_BCS_v<-as.vector(M1_BCS)
CV_BCS_v<-as.vector(CV_BCS)
```

```r
M1_BCS_v2<-cbind(M1_BCS_v,CV_BCS_v)
colnames(M1_BCS_v2)<-c("M1_BCS","CV_BCS")
a<- lag(M1_BCS_v,0)
x<- lag(M1_BCS_v,1)
y<- lag(M1_BCS_v,2)
z<- lag(M1_BCS_v,3)
M1_BCS_lags <- cbind(x,y,z)

fitM1_BCS1 <- auto.arima(M1_BCS_v2[4: 63,2], xreg=M1_BCS_lags[4: 63,1], d=0)
fitM1_BCS2 <- auto.arima(M1_BCS_v2[4: 63,2], xreg=M1_BCS_lags[4: 63,1:2], d=0)
fitM1_BCS3 <- auto.arima(M1_BCS_v2[4: 63,2], xreg=M1_BCS_lags[4: 63,1:3], d=0)
AIC_M1_BCS <- cbind(fitM1_BCS1$aic,fitM1_BCS2$aic,fitM1_BCS3$aic)
colnames(AIC_M1_BCS)<-c("1 lag","2 lags", "3 lags")
# CONF - BCS
CONF_BCS_v<-as.vector(CONF_BCS)
CV_BCS_v<-as.vector(CV_BCS)
CONF_BCS_v2<-cbind(CONF_BCS_v,CV_BCS_v)
colnames(CONF_BCS_v2)<-c("CONF_BCS","CV_BCS")
a<- lag(CONF_BCS_v,0)
x<- lag(CONF_BCS_v,1)
y<- lag(CONF_BCS_v,2)
z<- lag(CONF_BCS_v,3)
CONF_BCS_lags <- cbind(x,y,z)

fitCONF_BCS1 <- auto.arima(CONF_BCS_v2[4: 63,2], xreg=CONF_BCS_lags[4: 63,1], d=0)
fitCONF_BCS2 <- auto.arima(CONF_BCS_v2[4: 63,2], xreg=CONF_BCS_lags[4: 63,1:2], d=0)
fitCONF_BCS3 <- auto.arima(CONF_BCS_v2[4: 63,2], xreg=CONF_BCS_lags[4: 63,1:3], d=0)
AIC_CONF_BCS <- cbind(fitCONF_BCS1$aic,fitCONF_BCS2$aic,fitCONF_BCS3$aic)
colnames(AIC_CONF_BCS)<-c("1 lag","2 lags", "3 lags")

AICs_BCS<-rbind(AIC_IPV_BCS,AIC_UNEMP_BCS,AIC_REM_BCS,AIC_GDP_BCS,AIC_INPC_SUB_BCS,AIC_INPC_E_BCS,AIC_M
rownames(AICs_BCS)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_BCS
```

```
##              1 lag   2 lags   3 lags
## IPV       159.9565 159.2920 161.2598
## DESEMPLEO 156.7176 157.3914 158.9851
## REMESAS   159.9924 159.6887 161.2478
## PIB       160.2578 162.1119 162.6521
## INPC_SUB  157.4656 159.4630 158.2142
## INPC_E    159.9852 161.9807 163.3534
## M1        152.3930 154.3798 155.2091
## CONF      160.5722 161.6733 160.9084
```

```r
# CAMP
# IPV - CAMP
IPV_CAMP_v<-as.vector(IPV_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
IPV_CAMP_v2<-cbind(IPV_CAMP_v,CV_CAMP_v)
colnames(IPV_CAMP_v2)<-c("IPV_CAMP","CV_CAMP")
a<- lag(IPV_CAMP_v,0)
x<- lag(IPV_CAMP_v,1)
y<- lag(IPV_CAMP_v,2)
```

```
z<- lag(IPV_CAMP_v,3)
IPV_CAMP_lags <- cbind(x,y,z)

fitIPV_CAMP1 <- auto.arima(IPV_CAMP_v2[4: 63,2], xreg=IPV_CAMP_lags[4: 63,1], d=0)
fitIPV_CAMP2 <- auto.arima(IPV_CAMP_v2[4: 63,2], xreg=IPV_CAMP_lags[4: 63,1:2], d=0)
fitIPV_CAMP3 <- auto.arima(IPV_CAMP_v2[4: 63,2], xreg=IPV_CAMP_lags[4: 63,1:3], d=0)
AIC_IPV_CAMP <- cbind(fitIPV_CAMP1$aic,fitIPV_CAMP2$aic,fitIPV_CAMP3$aic)
colnames(AIC_IPV_CAMP)<-c("1 lag","2 lags", "3 lags")
# UNEMP - CAMP
UNEMP_CAMP_v<-as.vector(UNEMP_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
UNEMP_CAMP_v2<-cbind(UNEMP_CAMP_v,CV_CAMP_v)
colnames(UNEMP_CAMP_v2)<-c("UNEMP_CAMP","CV_CAMP")
a<- lag(UNEMP_CAMP_v,0)
x<- lag(UNEMP_CAMP_v,1)
y<- lag(UNEMP_CAMP_v,2)
z<- lag(UNEMP_CAMP_v,3)
UNEMP_CAMP_lags <- cbind(x,y,z)

fitUNEMP_CAMP1 <- auto.arima(UNEMP_CAMP_v2[4: 63,2], xreg=UNEMP_CAMP_lags[4: 63,1], d=0)
fitUNEMP_CAMP2 <- auto.arima(UNEMP_CAMP_v2[4: 63,2], xreg=UNEMP_CAMP_lags[4: 63,1:2], d=0)
fitUNEMP_CAMP3 <- auto.arima(UNEMP_CAMP_v2[4: 63,2], xreg=UNEMP_CAMP_lags[4: 63,1:3], d=0)
AIC_UNEMP_CAMP <- cbind(fitUNEMP_CAMP1$aic,fitUNEMP_CAMP2$aic,fitUNEMP_CAMP3$aic)
colnames(AIC_UNEMP_CAMP)<-c("1 lag","2 lags", "3 lags")
# REM - CAMP
REM_CAMP_v<-as.vector(REM_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
REM_CAMP_v2<-cbind(REM_CAMP_v,CV_CAMP_v)
colnames(REM_CAMP_v2)<-c("REM_CAMP","CV_CAMP")
a<- lag(REM_CAMP_v,0)
x<- lag(REM_CAMP_v,1)
y<- lag(REM_CAMP_v,2)
z<- lag(REM_CAMP_v,3)
REM_CAMP_lags <- cbind(x,y,z)

fitREM_CAMP1 <- auto.arima(REM_CAMP_v2[4: 63,2], xreg=REM_CAMP_lags[4: 63,1], d=0)
fitREM_CAMP2 <- auto.arima(REM_CAMP_v2[4: 63,2], xreg=REM_CAMP_lags[4: 63,1:2], d=0)
fitREM_CAMP3 <- auto.arima(REM_CAMP_v2[4: 63,2], xreg=REM_CAMP_lags[4: 63,1:3], d=0)
AIC_REM_CAMP <- cbind(fitREM_CAMP1$aic,fitREM_CAMP2$aic,fitREM_CAMP3$aic)
colnames(AIC_REM_CAMP)<-c("1 lag","2 lags", "3 lags")
# GDP - CAMP
GDP_CAMP_v<-as.vector(GDP_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
GDP_CAMP_v2<-cbind(GDP_CAMP_v,CV_CAMP_v)
colnames(GDP_CAMP_v2)<-c("GDP_CAMP","CV_CAMP")
a<- lag(GDP_CAMP_v,0)
x<- lag(GDP_CAMP_v,1)
y<- lag(GDP_CAMP_v,2)
z<- lag(GDP_CAMP_v,3)
GDP_CAMP_lags <- cbind(x,y,z)

fitGDP_CAMP1 <- auto.arima(GDP_CAMP_v2[4: 63,2], xreg=GDP_CAMP_lags[4: 63,1], d=0)
fitGDP_CAMP2 <- auto.arima(GDP_CAMP_v2[4: 63,2], xreg=GDP_CAMP_lags[4: 63,1:2], d=0)
```

```
fitGDP_CAMP3 <- auto.arima(GDP_CAMP_v2[4: 63,2], xreg=GDP_CAMP_lags[4: 63,1:3], d=0)
AIC_GDP_CAMP <- cbind(fitGDP_CAMP1$aic,fitGDP_CAMP2$aic,fitGDP_CAMP3$aic)
colnames(AIC_GDP_CAMP)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - CAMP
INPC_SUB_CAMP_v<-as.vector(INPC_SUB_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
INPC_SUB_CAMP_v2<-cbind(INPC_SUB_CAMP_v,CV_CAMP_v)
colnames(INPC_SUB_CAMP_v2)<-c("INPC_SUB_CAMP","CV_CAMP")
a<- lag(INPC_SUB_CAMP_v,0)
x<- lag(INPC_SUB_CAMP_v,1)
y<- lag(INPC_SUB_CAMP_v,2)
z<- lag(INPC_SUB_CAMP_v,3)
INPC_SUB_CAMP_lags <- cbind(x,y,z)

fitINPC_SUB_CAMP1 <- auto.arima(INPC_SUB_CAMP_v2[4: 63,2], xreg=INPC_SUB_CAMP_lags[4: 63,1], d=0)
fitINPC_SUB_CAMP2 <- auto.arima(INPC_SUB_CAMP_v2[4: 63,2], xreg=INPC_SUB_CAMP_lags[4: 63,1:2], d=0)
fitINPC_SUB_CAMP3 <- auto.arima(INPC_SUB_CAMP_v2[4: 63,2], xreg=INPC_SUB_CAMP_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_CAMP <- cbind(fitINPC_SUB_CAMP1$aic,fitINPC_SUB_CAMP2$aic,fitINPC_SUB_CAMP3$aic)
colnames(AIC_INPC_SUB_CAMP)<-c("1 lag","2 lags", "3 lags")
# INPC_E - CAMP
INPC_E_CAMP_v<-as.vector(INPC_E_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
INPC_E_CAMP_v2<-cbind(INPC_E_CAMP_v,CV_CAMP_v)
colnames(INPC_E_CAMP_v2)<-c("INPC_E_CAMP","CV_CAMP")
a<- lag(INPC_E_CAMP_v,0)
x<- lag(INPC_E_CAMP_v,1)
y<- lag(INPC_E_CAMP_v,2)
z<- lag(INPC_E_CAMP_v,3)
INPC_E_CAMP_lags <- cbind(x,y,z)

fitINPC_E_CAMP1 <- auto.arima(INPC_E_CAMP_v2[4: 63,2], xreg=INPC_E_CAMP_lags[4: 63,1], d=0)
fitINPC_E_CAMP2 <- auto.arima(INPC_E_CAMP_v2[4: 63,2], xreg=INPC_E_CAMP_lags[4: 63,1:2], d=0)
fitINPC_E_CAMP3 <- auto.arima(INPC_E_CAMP_v2[4: 63,2], xreg=INPC_E_CAMP_lags[4: 63,1:3], d=0)
AIC_INPC_E_CAMP <- cbind(fitINPC_E_CAMP1$aic,fitINPC_E_CAMP2$aic,fitINPC_E_CAMP3$aic)
colnames(AIC_INPC_E_CAMP)<-c("1 lag","2 lags", "3 lags")
# M1 - CAMP
M1_CAMP_v<-as.vector(M1_CAMP)
CV_CAMP_v<-as.vector(CV_CAMP)
M1_CAMP_v2<-cbind(M1_CAMP_v,CV_CAMP_v)
colnames(M1_CAMP_v2)<-c("M1_CAMP","CV_CAMP")
a<- lag(M1_CAMP_v,0)
x<- lag(M1_CAMP_v,1)
y<- lag(M1_CAMP_v,2)
z<- lag(M1_CAMP_v,3)
M1_CAMP_lags <- cbind(x,y,z)

fitM1_CAMP1 <- auto.arima(M1_CAMP_v2[4: 63,2], xreg=M1_CAMP_lags[4: 63,1], d=0)
fitM1_CAMP2 <- auto.arima(M1_CAMP_v2[4: 63,2], xreg=M1_CAMP_lags[4: 63,1:2], d=0)
fitM1_CAMP3 <- auto.arima(M1_CAMP_v2[4: 63,2], xreg=M1_CAMP_lags[4: 63,1:3], d=0)
AIC_M1_CAMP <- cbind(fitM1_CAMP1$aic,fitM1_CAMP2$aic,fitM1_CAMP3$aic)
colnames(AIC_M1_CAMP)<-c("1 lag","2 lags", "3 lags")
# CONF - CAMP
CONF_CAMP_v<-as.vector(CONF_CAMP)
```

```r
CV_CAMP_v<-as.vector(CV_CAMP)
CONF_CAMP_v2<-cbind(CONF_CAMP_v,CV_CAMP_v)
colnames(CONF_CAMP_v2)<-c("CONF_CAMP","CV_CAMP")
a<- lag(CONF_CAMP_v,0)
x<- lag(CONF_CAMP_v,1)
y<- lag(CONF_CAMP_v,2)
z<- lag(CONF_CAMP_v,3)
CONF_CAMP_lags <- cbind(x,y,z)

fitCONF_CAMP1 <- auto.arima(CONF_CAMP_v2[4: 63,2], xreg=CONF_CAMP_lags[4: 63,1], d=0)
fitCONF_CAMP2 <- auto.arima(CONF_CAMP_v2[4: 63,2], xreg=CONF_CAMP_lags[4: 63,1:2], d=0)
fitCONF_CAMP3 <- auto.arima(CONF_CAMP_v2[4: 63,2], xreg=CONF_CAMP_lags[4: 63,1:3], d=0)
AIC_CONF_CAMP <- cbind(fitCONF_CAMP1$aic,fitCONF_CAMP2$aic,fitCONF_CAMP3$aic)
colnames(AIC_CONF_CAMP)<-c("1 lag","2 lags", "3 lags")

AICs_CAMP<-rbind(AIC_IPV_CAMP,AIC_UNEMP_CAMP,AIC_REM_CAMP,AIC_GDP_CAMP,AIC_INPC_SUB_CAMP,AIC_INPC_E_CAM
rownames(AICs_CAMP)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_CAMP
```

```
##                1 lag    2 lags    3 lags
## IPV       -17.74563 -17.97292 -16.85887
## DESEMPLEO -17.26334 -18.14302 -16.31275
## REMESAS   -17.24675 -15.48430 -13.71220
## PIB       -17.91407 -17.53405 -18.13752
## INPC_SUB  -17.29990 -17.50863 -15.66980
## INPC_E    -17.29637 -15.84035 -14.87277
## M1        -17.42902 -15.52067 -14.60297
## CONF      -17.33696 -15.54974 -18.24757
```

```r
# CDMX
# IPV - CDMX
IPV_CDMX_v<-as.vector(IPV_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
IPV_CDMX_v2<-cbind(IPV_CDMX_v,CV_CDMX_v)
colnames(IPV_CDMX_v2)<-c("IPV_CDMX","CV_CDMX")
a<- lag(IPV_CDMX_v,0)
x<- lag(IPV_CDMX_v,1)
y<- lag(IPV_CDMX_v,2)
z<- lag(IPV_CDMX_v,3)
IPV_CDMX_lags <- cbind(x,y,z)

fitIPV_CDMX1 <- auto.arima(IPV_CDMX_v2[4: 63,2], xreg=IPV_CDMX_lags[4: 63,1], d=0)
fitIPV_CDMX2 <- auto.arima(IPV_CDMX_v2[4: 63,2], xreg=IPV_CDMX_lags[4: 63,1:2], d=0)
fitIPV_CDMX3 <- auto.arima(IPV_CDMX_v2[4: 63,2], xreg=IPV_CDMX_lags[4: 63,1:3], d=0)
AIC_IPV_CDMX <- cbind(fitIPV_CDMX1$aic,fitIPV_CDMX2$aic,fitIPV_CDMX3$aic)
colnames(AIC_IPV_CDMX)<-c("1 lag","2 lags", "3 lags")
# UNEMP - CDMX
UNEMP_CDMX_v<-as.vector(UNEMP_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
UNEMP_CDMX_v2<-cbind(UNEMP_CDMX_v,CV_CDMX_v)
colnames(UNEMP_CDMX_v2)<-c("UNEMP_CDMX","CV_CDMX")
a<- lag(UNEMP_CDMX_v,0)
x<- lag(UNEMP_CDMX_v,1)
```

```
y<- lag(UNEMP_CDMX_v,2)
z<- lag(UNEMP_CDMX_v,3)
UNEMP_CDMX_lags <- cbind(x,y,z)

fitUNEMP_CDMX1 <- auto.arima(UNEMP_CDMX_v2[4: 63,2], xreg=UNEMP_CDMX_lags[4: 63,1], d=0)
fitUNEMP_CDMX2 <- auto.arima(UNEMP_CDMX_v2[4: 63,2], xreg=UNEMP_CDMX_lags[4: 63,1:2], d=0)
fitUNEMP_CDMX3 <- auto.arima(UNEMP_CDMX_v2[4: 63,2], xreg=UNEMP_CDMX_lags[4: 63,1:3], d=0)
AIC_UNEMP_CDMX <- cbind(fitUNEMP_CDMX1$aic,fitUNEMP_CDMX2$aic,fitUNEMP_CDMX3$aic)
colnames(AIC_UNEMP_CDMX)<-c("1 lag","2 lags", "3 lags")
# REM - CDMX
REM_CDMX_v<-as.vector(REM_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
REM_CDMX_v2<-cbind(REM_CDMX_v,CV_CDMX_v)
colnames(REM_CDMX_v2)<-c("REM_CDMX","CV_CDMX")
a<- lag(REM_CDMX_v,0)
x<- lag(REM_CDMX_v,1)
y<- lag(REM_CDMX_v,2)
z<- lag(REM_CDMX_v,3)
REM_CDMX_lags <- cbind(x,y,z)

fitREM_CDMX1 <- auto.arima(REM_CDMX_v2[4: 63,2], xreg=REM_CDMX_lags[4: 63,1], d=0)
fitREM_CDMX2 <- auto.arima(REM_CDMX_v2[4: 63,2], xreg=REM_CDMX_lags[4: 63,1:2], d=0)
fitREM_CDMX3 <- auto.arima(REM_CDMX_v2[4: 63,2], xreg=REM_CDMX_lags[4: 63,1:3], d=0)
AIC_REM_CDMX <- cbind(fitREM_CDMX1$aic,fitREM_CDMX2$aic,fitREM_CDMX3$aic)
colnames(AIC_REM_CDMX)<-c("1 lag","2 lags", "3 lags")
# GDP - CDMX
GDP_CDMX_v<-as.vector(GDP_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
GDP_CDMX_v2<-cbind(GDP_CDMX_v,CV_CDMX_v)
colnames(GDP_CDMX_v2)<-c("GDP_CDMX","CV_CDMX")
a<- lag(GDP_CDMX_v,0)
x<- lag(GDP_CDMX_v,1)
y<- lag(GDP_CDMX_v,2)
z<- lag(GDP_CDMX_v,3)
GDP_CDMX_lags <- cbind(x,y,z)

fitGDP_CDMX1 <- auto.arima(GDP_CDMX_v2[4: 63,2], xreg=GDP_CDMX_lags[4: 63,1], d=0)
fitGDP_CDMX2 <- auto.arima(GDP_CDMX_v2[4: 63,2], xreg=GDP_CDMX_lags[4: 63,1:2], d=0)
fitGDP_CDMX3 <- auto.arima(GDP_CDMX_v2[4: 63,2], xreg=GDP_CDMX_lags[4: 63,1:3], d=0)
AIC_GDP_CDMX <- cbind(fitGDP_CDMX1$aic,fitGDP_CDMX2$aic,fitGDP_CDMX3$aic)
colnames(AIC_GDP_CDMX)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - CDMX
INPC_SUB_CDMX_v<-as.vector(INPC_SUB_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
INPC_SUB_CDMX_v2<-cbind(INPC_SUB_CDMX_v,CV_CDMX_v)
colnames(INPC_SUB_CDMX_v2)<-c("INPC_SUB_CDMX","CV_CDMX")
a<- lag(INPC_SUB_CDMX_v,0)
x<- lag(INPC_SUB_CDMX_v,1)
y<- lag(INPC_SUB_CDMX_v,2)
z<- lag(INPC_SUB_CDMX_v,3)
INPC_SUB_CDMX_lags <- cbind(x,y,z)

fitINPC_SUB_CDMX1 <- auto.arima(INPC_SUB_CDMX_v2[4: 63,2], xreg=INPC_SUB_CDMX_lags[4: 63,1], d=0)
```

```
fitINPC_SUB_CDMX2 <- auto.arima(INPC_SUB_CDMX_v2[4: 63,2], xreg=INPC_SUB_CDMX_lags[4: 63,1:2], d=0)
fitINPC_SUB_CDMX3 <- auto.arima(INPC_SUB_CDMX_v2[4: 63,2], xreg=INPC_SUB_CDMX_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_CDMX <- cbind(fitINPC_SUB_CDMX1$aic,fitINPC_SUB_CDMX2$aic,fitINPC_SUB_CDMX3$aic)
colnames(AIC_INPC_SUB_CDMX)<-c("1 lag","2 lags", "3 lags")
# INPC_E - CDMX
INPC_E_CDMX_v<-as.vector(INPC_E_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
INPC_E_CDMX_v2<-cbind(INPC_E_CDMX_v,CV_CDMX_v)
colnames(INPC_E_CDMX_v2)<-c("INPC_E_CDMX","CV_CDMX")
a<- lag(INPC_E_CDMX_v,0)
x<- lag(INPC_E_CDMX_v,1)
y<- lag(INPC_E_CDMX_v,2)
z<- lag(INPC_E_CDMX_v,3)
INPC_E_CDMX_lags <- cbind(x,y,z)

fitINPC_E_CDMX1 <- auto.arima(INPC_E_CDMX_v2[4: 63,2], xreg=INPC_E_CDMX_lags[4: 63,1], d=0)
fitINPC_E_CDMX2 <- auto.arima(INPC_E_CDMX_v2[4: 63,2], xreg=INPC_E_CDMX_lags[4: 63,1:2], d=0)
fitINPC_E_CDMX3 <- auto.arima(INPC_E_CDMX_v2[4: 63,2], xreg=INPC_E_CDMX_lags[4: 63,1:3], d=0)
AIC_INPC_E_CDMX <- cbind(fitINPC_E_CDMX1$aic,fitINPC_E_CDMX2$aic,fitINPC_E_CDMX3$aic)
colnames(AIC_INPC_E_CDMX)<-c("1 lag","2 lags", "3 lags")
# M1 - CDMX
M1_CDMX_v<-as.vector(M1_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
M1_CDMX_v2<-cbind(M1_CDMX_v,CV_CDMX_v)
colnames(M1_CDMX_v2)<-c("M1_CDMX","CV_CDMX")
a<- lag(M1_CDMX_v,0)
x<- lag(M1_CDMX_v,1)
y<- lag(M1_CDMX_v,2)
z<- lag(M1_CDMX_v,3)
M1_CDMX_lags <- cbind(x,y,z)

fitM1_CDMX1 <- auto.arima(M1_CDMX_v2[4: 63,2], xreg=M1_CDMX_lags[4: 63,1], d=0)
fitM1_CDMX2 <- auto.arima(M1_CDMX_v2[4: 63,2], xreg=M1_CDMX_lags[4: 63,1:2], d=0)
fitM1_CDMX3 <- auto.arima(M1_CDMX_v2[4: 63,2], xreg=M1_CDMX_lags[4: 63,1:3], d=0)
AIC_M1_CDMX <- cbind(fitM1_CDMX1$aic,fitM1_CDMX2$aic,fitM1_CDMX3$aic)
colnames(AIC_M1_CDMX)<-c("1 lag","2 lags", "3 lags")
# CONF - CDMX
CONF_CDMX_v<-as.vector(CONF_CDMX)
CV_CDMX_v<-as.vector(CV_CDMX)
CONF_CDMX_v2<-cbind(CONF_CDMX_v,CV_CDMX_v)
colnames(CONF_CDMX_v2)<-c("CONF_CDMX","CV_CDMX")
a<- lag(CONF_CDMX_v,0)
x<- lag(CONF_CDMX_v,1)
y<- lag(CONF_CDMX_v,2)
z<- lag(CONF_CDMX_v,3)
CONF_CDMX_lags <- cbind(x,y,z)

fitCONF_CDMX1 <- auto.arima(CONF_CDMX_v2[4: 63,2], xreg=CONF_CDMX_lags[4: 63,1], d=0)
fitCONF_CDMX2 <- auto.arima(CONF_CDMX_v2[4: 63,2], xreg=CONF_CDMX_lags[4: 63,1:2], d=0)
fitCONF_CDMX3 <- auto.arima(CONF_CDMX_v2[4: 63,2], xreg=CONF_CDMX_lags[4: 63,1:3], d=0)
AIC_CONF_CDMX <- cbind(fitCONF_CDMX1$aic,fitCONF_CDMX2$aic,fitCONF_CDMX3$aic)
colnames(AIC_CONF_CDMX)<-c("1 lag","2 lags", "3 lags")
```

```
AICs_CDMX<-rbind(AIC_IPV_CDMX,AIC_UNEMP_CDMX,AIC_REM_CDMX,AIC_GDP_CDMX,AIC_INPC_SUB_CDMX,AIC_INPC_E_CDM
rownames(AICs_CDMX)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_CDMX
```

```
##              1 lag   2 lags   3 lags
## IPV       106.4484 108.4466 108.4229
## DESEMPLEO 106.5856 105.9050 107.3634
## REMESAS   104.3981 105.3955 107.3775
## PIB       105.6362 107.3902 109.3636
## INPC_SUB  106.3518 100.1508 101.9726
## INPC_E    105.7370 106.2984 108.2982
## M1        106.4456 107.8694 107.5122
## CONF      104.9015 105.7376 107.4610
```

```
# CHIH
# IPV - CHIH
IPV_CHIH_v<-as.vector(IPV_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
IPV_CHIH_v2<-cbind(IPV_CHIH_v,CV_CHIH_v)
colnames(IPV_CHIH_v2)<-c("IPV_CHIH","CV_CHIH")
a<- lag(IPV_CHIH_v,0)
x<- lag(IPV_CHIH_v,1)
y<- lag(IPV_CHIH_v,2)
z<- lag(IPV_CHIH_v,3)
IPV_CHIH_lags <- cbind(x,y,z)

fitIPV_CHIH1 <- auto.arima(IPV_CHIH_v2[4: 63,2], xreg=IPV_CHIH_lags[4: 63,1], d=0)
fitIPV_CHIH2 <- auto.arima(IPV_CHIH_v2[4: 63,2], xreg=IPV_CHIH_lags[4: 63,1:2], d=0)
fitIPV_CHIH3 <- auto.arima(IPV_CHIH_v2[4: 63,2], xreg=IPV_CHIH_lags[4: 63,1:3], d=0)
AIC_IPV_CHIH <- cbind(fitIPV_CHIH1$aic,fitIPV_CHIH2$aic,fitIPV_CHIH3$aic)
colnames(AIC_IPV_CHIH)<-c("1 lag","2 lags", "3 lags")
# UNEMP - CHIH
UNEMP_CHIH_v<-as.vector(UNEMP_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
UNEMP_CHIH_v2<-cbind(UNEMP_CHIH_v,CV_CHIH_v)
colnames(UNEMP_CHIH_v2)<-c("UNEMP_CHIH","CV_CHIH")
a<- lag(UNEMP_CHIH_v,0)
x<- lag(UNEMP_CHIH_v,1)
y<- lag(UNEMP_CHIH_v,2)
z<- lag(UNEMP_CHIH_v,3)
UNEMP_CHIH_lags <- cbind(x,y,z)

fitUNEMP_CHIH1 <- auto.arima(UNEMP_CHIH_v2[4: 63,2], xreg=UNEMP_CHIH_lags[4: 63,1], d=0)
fitUNEMP_CHIH2 <- auto.arima(UNEMP_CHIH_v2[4: 63,2], xreg=UNEMP_CHIH_lags[4: 63,1:2], d=0)
fitUNEMP_CHIH3 <- auto.arima(UNEMP_CHIH_v2[4: 63,2], xreg=UNEMP_CHIH_lags[4: 63,1:3], d=0)
AIC_UNEMP_CHIH <- cbind(fitUNEMP_CHIH1$aic,fitUNEMP_CHIH2$aic,fitUNEMP_CHIH3$aic)
colnames(AIC_UNEMP_CHIH)<-c("1 lag","2 lags", "3 lags")
# REM - CHIH
REM_CHIH_v<-as.vector(REM_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
REM_CHIH_v2<-cbind(REM_CHIH_v,CV_CHIH_v)
colnames(REM_CHIH_v2)<-c("REM_CHIH","CV_CHIH")
a<- lag(REM_CHIH_v,0)
```

```
x<- lag(REM_CHIH_v,1)
y<- lag(REM_CHIH_v,2)
z<- lag(REM_CHIH_v,3)
REM_CHIH_lags <- cbind(x,y,z)

fitREM_CHIH1 <- auto.arima(REM_CHIH_v2[4: 63,2], xreg=REM_CHIH_lags[4: 63,1], d=0)
fitREM_CHIH2 <- auto.arima(REM_CHIH_v2[4: 63,2], xreg=REM_CHIH_lags[4: 63,1:2], d=0)
fitREM_CHIH3 <- auto.arima(REM_CHIH_v2[4: 63,2], xreg=REM_CHIH_lags[4: 63,1:3], d=0)
AIC_REM_CHIH <- cbind(fitREM_CHIH1$aic,fitREM_CHIH2$aic,fitREM_CHIH3$aic)
colnames(AIC_REM_CHIH)<-c("1 lag","2 lags", "3 lags")
# GDP - CHIH
GDP_CHIH_v<-as.vector(GDP_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
GDP_CHIH_v2<-cbind(GDP_CHIH_v,CV_CHIH_v)
colnames(GDP_CHIH_v2)<-c("GDP_CHIH","CV_CHIH")
a<- lag(GDP_CHIH_v,0)
x<- lag(GDP_CHIH_v,1)
y<- lag(GDP_CHIH_v,2)
z<- lag(GDP_CHIH_v,3)
GDP_CHIH_lags <- cbind(x,y,z)

fitGDP_CHIH1 <- auto.arima(GDP_CHIH_v2[4: 63,2], xreg=GDP_CHIH_lags[4: 63,1], d=0)
fitGDP_CHIH2 <- auto.arima(GDP_CHIH_v2[4: 63,2], xreg=GDP_CHIH_lags[4: 63,1:2], d=0)
fitGDP_CHIH3 <- auto.arima(GDP_CHIH_v2[4: 63,2], xreg=GDP_CHIH_lags[4: 63,1:3], d=0)
AIC_GDP_CHIH <- cbind(fitGDP_CHIH1$aic,fitGDP_CHIH2$aic,fitGDP_CHIH3$aic)
colnames(AIC_GDP_CHIH)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - CHIH
INPC_SUB_CHIH_v<-as.vector(INPC_SUB_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
INPC_SUB_CHIH_v2<-cbind(INPC_SUB_CHIH_v,CV_CHIH_v)
colnames(INPC_SUB_CHIH_v2)<-c("INPC_SUB_CHIH","CV_CHIH")
a<- lag(INPC_SUB_CHIH_v,0)
x<- lag(INPC_SUB_CHIH_v,1)
y<- lag(INPC_SUB_CHIH_v,2)
z<- lag(INPC_SUB_CHIH_v,3)
INPC_SUB_CHIH_lags <- cbind(x,y,z)

fitINPC_SUB_CHIH1 <- auto.arima(INPC_SUB_CHIH_v2[4: 63,2], xreg=INPC_SUB_CHIH_lags[4: 63,1], d=0)
fitINPC_SUB_CHIH2 <- auto.arima(INPC_SUB_CHIH_v2[4: 63,2], xreg=INPC_SUB_CHIH_lags[4: 63,1:2], d=0)
fitINPC_SUB_CHIH3 <- auto.arima(INPC_SUB_CHIH_v2[4: 63,2], xreg=INPC_SUB_CHIH_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_CHIH <- cbind(fitINPC_SUB_CHIH1$aic,fitINPC_SUB_CHIH2$aic,fitINPC_SUB_CHIH3$aic)
colnames(AIC_INPC_SUB_CHIH)<-c("1 lag","2 lags", "3 lags")
# INPC_E - CHIH
INPC_E_CHIH_v<-as.vector(INPC_E_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
INPC_E_CHIH_v2<-cbind(INPC_E_CHIH_v,CV_CHIH_v)
colnames(INPC_E_CHIH_v2)<-c("INPC_E_CHIH","CV_CHIH")
a<- lag(INPC_E_CHIH_v,0)
x<- lag(INPC_E_CHIH_v,1)
y<- lag(INPC_E_CHIH_v,2)
z<- lag(INPC_E_CHIH_v,3)
INPC_E_CHIH_lags <- cbind(x,y,z)
```

```
fitINPC_E_CHIH1 <- auto.arima(INPC_E_CHIH_v2[4: 63,2], xreg=INPC_E_CHIH_lags[4: 63,1], d=0)
fitINPC_E_CHIH2 <- auto.arima(INPC_E_CHIH_v2[4: 63,2], xreg=INPC_E_CHIH_lags[4: 63,1:2], d=0)
fitINPC_E_CHIH3 <- auto.arima(INPC_E_CHIH_v2[4: 63,2], xreg=INPC_E_CHIH_lags[4: 63,1:3], d=0)
AIC_INPC_E_CHIH <- cbind(fitINPC_E_CHIH1$aic,fitINPC_E_CHIH2$aic,fitINPC_E_CHIH3$aic)
colnames(AIC_INPC_E_CHIH)<-c("1 lag","2 lags", "3 lags")
# M1 - CHIH
M1_CHIH_v<-as.vector(M1_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
M1_CHIH_v2<-cbind(M1_CHIH_v,CV_CHIH_v)
colnames(M1_CHIH_v2)<-c("M1_CHIH","CV_CHIH")
a<- lag(M1_CHIH_v,0)
x<- lag(M1_CHIH_v,1)
y<- lag(M1_CHIH_v,2)
z<- lag(M1_CHIH_v,3)
M1_CHIH_lags <- cbind(x,y,z)

fitM1_CHIH1 <- auto.arima(M1_CHIH_v2[4: 63,2], xreg=M1_CHIH_lags[4: 63,1], d=0)
fitM1_CHIH2 <- auto.arima(M1_CHIH_v2[4: 63,2], xreg=M1_CHIH_lags[4: 63,1:2], d=0)
fitM1_CHIH3 <- auto.arima(M1_CHIH_v2[4: 63,2], xreg=M1_CHIH_lags[4: 63,1:3], d=0)
AIC_M1_CHIH <- cbind(fitM1_CHIH1$aic,fitM1_CHIH2$aic,fitM1_CHIH3$aic)
colnames(AIC_M1_CHIH)<-c("1 lag","2 lags", "3 lags")
# CONF - CHIH
CONF_CHIH_v<-as.vector(CONF_CHIH)
CV_CHIH_v<-as.vector(CV_CHIH)
CONF_CHIH_v2<-cbind(CONF_CHIH_v,CV_CHIH_v)
colnames(CONF_CHIH_v2)<-c("CONF_CHIH","CV_CHIH")
a<- lag(CONF_CHIH_v,0)
x<- lag(CONF_CHIH_v,1)
y<- lag(CONF_CHIH_v,2)
z<- lag(CONF_CHIH_v,3)
CONF_CHIH_lags <- cbind(x,y,z)

fitCONF_CHIH1 <- auto.arima(CONF_CHIH_v2[4: 63,2], xreg=CONF_CHIH_lags[4: 63,1], d=0)
fitCONF_CHIH2 <- auto.arima(CONF_CHIH_v2[4: 63,2], xreg=CONF_CHIH_lags[4: 63,1:2], d=0)
fitCONF_CHIH3 <- auto.arima(CONF_CHIH_v2[4: 63,2], xreg=CONF_CHIH_lags[4: 63,1:3], d=0)
AIC_CONF_CHIH <- cbind(fitCONF_CHIH1$aic,fitCONF_CHIH2$aic,fitCONF_CHIH3$aic)
colnames(AIC_CONF_CHIH)<-c("1 lag","2 lags", "3 lags")

AICs_CHIH<-rbind(AIC_IPV_CHIH,AIC_UNEMP_CHIH,AIC_REM_CHIH,AIC_GDP_CHIH,AIC_INPC_SUB_CHIH,AIC_INPC_E_CHI
rownames(AICs_CHIH)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_CHIH
```

```
##              1 lag   2 lags   3 lags
## IPV       105.0863 106.7202 105.5749
## DESEMPLEO 105.6033 107.5438 108.9946
## REMESAS   105.8073 106.7159 107.0872
## PIB       105.1836 106.6108 108.0792
## INPC_SUB  104.1264 105.1549 106.2296
## INPC_E    106.1659 108.1582 110.1441
## M1        104.9637 106.7118 108.4809
## CONF      106.1918 104.5427 106.5080
```

```
# CHIS
# IPV - CHIS
IPV_CHIS_v<-as.vector(IPV_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
IPV_CHIS_v2<-cbind(IPV_CHIS_v,CV_CHIS_v)
colnames(IPV_CHIS_v2)<-c("IPV_CHIS","CV_CHIS")
a<- lag(IPV_CHIS_v,0)
x<- lag(IPV_CHIS_v,1)
y<- lag(IPV_CHIS_v,2)
z<- lag(IPV_CHIS_v,3)
IPV_CHIS_lags <- cbind(x,y,z)

fitIPV_CHIS1 <- auto.arima(IPV_CHIS_v2[4: 63,2], xreg=IPV_CHIS_lags[4: 63,1], d=0)
fitIPV_CHIS2 <- auto.arima(IPV_CHIS_v2[4: 63,2], xreg=IPV_CHIS_lags[4: 63,1:2], d=0)
fitIPV_CHIS3 <- auto.arima(IPV_CHIS_v2[4: 63,2], xreg=IPV_CHIS_lags[4: 63,1:3], d=0)
AIC_IPV_CHIS <- cbind(fitIPV_CHIS1$aic,fitIPV_CHIS2$aic,fitIPV_CHIS3$aic)
colnames(AIC_IPV_CHIS)<-c("1 lag","2 lags", "3 lags")
# UNEMP - CHIS
UNEMP_CHIS_v<-as.vector(UNEMP_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
UNEMP_CHIS_v2<-cbind(UNEMP_CHIS_v,CV_CHIS_v)
colnames(UNEMP_CHIS_v2)<-c("UNEMP_CHIS","CV_CHIS")
a<- lag(UNEMP_CHIS_v,0)
x<- lag(UNEMP_CHIS_v,1)
y<- lag(UNEMP_CHIS_v,2)
z<- lag(UNEMP_CHIS_v,3)
UNEMP_CHIS_lags <- cbind(x,y,z)

fitUNEMP_CHIS1 <- auto.arima(UNEMP_CHIS_v2[4: 63,2], xreg=UNEMP_CHIS_lags[4: 63,1], d=0)
fitUNEMP_CHIS2 <- auto.arima(UNEMP_CHIS_v2[4: 63,2], xreg=UNEMP_CHIS_lags[4: 63,1:2], d=0)
fitUNEMP_CHIS3 <- auto.arima(UNEMP_CHIS_v2[4: 63,2], xreg=UNEMP_CHIS_lags[4: 63,1:3], d=0)
AIC_UNEMP_CHIS <- cbind(fitUNEMP_CHIS1$aic,fitUNEMP_CHIS2$aic,fitUNEMP_CHIS3$aic)
colnames(AIC_UNEMP_CHIS)<-c("1 lag","2 lags", "3 lags")
# REM - CHIS
REM_CHIS_v<-as.vector(REM_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
REM_CHIS_v2<-cbind(REM_CHIS_v,CV_CHIS_v)
colnames(REM_CHIS_v2)<-c("REM_CHIS","CV_CHIS")
a<- lag(REM_CHIS_v,0)
x<- lag(REM_CHIS_v,1)
y<- lag(REM_CHIS_v,2)
z<- lag(REM_CHIS_v,3)
REM_CHIS_lags <- cbind(x,y,z)

fitREM_CHIS1 <- auto.arima(REM_CHIS_v2[4: 63,2], xreg=REM_CHIS_lags[4: 63,1], d=0)
fitREM_CHIS2 <- auto.arima(REM_CHIS_v2[4: 63,2], xreg=REM_CHIS_lags[4: 63,1:2], d=0)
fitREM_CHIS3 <- auto.arima(REM_CHIS_v2[4: 63,2], xreg=REM_CHIS_lags[4: 63,1:3], d=0)
AIC_REM_CHIS <- cbind(fitREM_CHIS1$aic,fitREM_CHIS2$aic,fitREM_CHIS3$aic)
colnames(AIC_REM_CHIS)<-c("1 lag","2 lags", "3 lags")
# GDP - CHIS
GDP_CHIS_v<-as.vector(GDP_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
GDP_CHIS_v2<-cbind(GDP_CHIS_v,CV_CHIS_v)
```

```
colnames(GDP_CHIS_v2)<-c("GDP_CHIS","CV_CHIS")
a<- lag(GDP_CHIS_v,0)
x<- lag(GDP_CHIS_v,1)
y<- lag(GDP_CHIS_v,2)
z<- lag(GDP_CHIS_v,3)
GDP_CHIS_lags <- cbind(x,y,z)

fitGDP_CHIS1 <- auto.arima(GDP_CHIS_v2[4: 63,2], xreg=GDP_CHIS_lags[4: 63,1], d=0)
fitGDP_CHIS2 <- auto.arima(GDP_CHIS_v2[4: 63,2], xreg=GDP_CHIS_lags[4: 63,1:2], d=0)
fitGDP_CHIS3 <- auto.arima(GDP_CHIS_v2[4: 63,2], xreg=GDP_CHIS_lags[4: 63,1:3], d=0)
AIC_GDP_CHIS <- cbind(fitGDP_CHIS1$aic,fitGDP_CHIS2$aic,fitGDP_CHIS3$aic)
colnames(AIC_GDP_CHIS)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - CHIS
INPC_SUB_CHIS_v<-as.vector(INPC_SUB_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
INPC_SUB_CHIS_v2<-cbind(INPC_SUB_CHIS_v,CV_CHIS_v)
colnames(INPC_SUB_CHIS_v2)<-c("INPC_SUB_CHIS","CV_CHIS")
a<- lag(INPC_SUB_CHIS_v,0)
x<- lag(INPC_SUB_CHIS_v,1)
y<- lag(INPC_SUB_CHIS_v,2)
z<- lag(INPC_SUB_CHIS_v,3)
INPC_SUB_CHIS_lags <- cbind(x,y,z)

fitINPC_SUB_CHIS1 <- auto.arima(INPC_SUB_CHIS_v2[4: 63,2], xreg=INPC_SUB_CHIS_lags[4: 63,1], d=0)
fitINPC_SUB_CHIS2 <- auto.arima(INPC_SUB_CHIS_v2[4: 63,2], xreg=INPC_SUB_CHIS_lags[4: 63,1:2], d=0)
fitINPC_SUB_CHIS3 <- auto.arima(INPC_SUB_CHIS_v2[4: 63,2], xreg=INPC_SUB_CHIS_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_CHIS <- cbind(fitINPC_SUB_CHIS1$aic,fitINPC_SUB_CHIS2$aic,fitINPC_SUB_CHIS3$aic)
colnames(AIC_INPC_SUB_CHIS)<-c("1 lag","2 lags", "3 lags")
# INPC_E - CHIS
INPC_E_CHIS_v<-as.vector(INPC_E_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
INPC_E_CHIS_v2<-cbind(INPC_E_CHIS_v,CV_CHIS_v)
colnames(INPC_E_CHIS_v2)<-c("INPC_E_CHIS","CV_CHIS")
a<- lag(INPC_E_CHIS_v,0)
x<- lag(INPC_E_CHIS_v,1)
y<- lag(INPC_E_CHIS_v,2)
z<- lag(INPC_E_CHIS_v,3)
INPC_E_CHIS_lags <- cbind(x,y,z)

fitINPC_E_CHIS1 <- auto.arima(INPC_E_CHIS_v2[4: 63,2], xreg=INPC_E_CHIS_lags[4: 63,1], d=0)
fitINPC_E_CHIS2 <- auto.arima(INPC_E_CHIS_v2[4: 63,2], xreg=INPC_E_CHIS_lags[4: 63,1:2], d=0)
fitINPC_E_CHIS3 <- auto.arima(INPC_E_CHIS_v2[4: 63,2], xreg=INPC_E_CHIS_lags[4: 63,1:3], d=0)
AIC_INPC_E_CHIS <- cbind(fitINPC_E_CHIS1$aic,fitINPC_E_CHIS2$aic,fitINPC_E_CHIS3$aic)
colnames(AIC_INPC_E_CHIS)<-c("1 lag","2 lags", "3 lags")
# M1 - CHIS
M1_CHIS_v<-as.vector(M1_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
M1_CHIS_v2<-cbind(M1_CHIS_v,CV_CHIS_v)
colnames(M1_CHIS_v2)<-c("M1_CHIS","CV_CHIS")
a<- lag(M1_CHIS_v,0)
x<- lag(M1_CHIS_v,1)
y<- lag(M1_CHIS_v,2)
z<- lag(M1_CHIS_v,3)
```

```r
M1_CHIS_lags <- cbind(x,y,z)

fitM1_CHIS1 <- auto.arima(M1_CHIS_v2[4: 63,2], xreg=M1_CHIS_lags[4: 63,1], d=0)
fitM1_CHIS2 <- auto.arima(M1_CHIS_v2[4: 63,2], xreg=M1_CHIS_lags[4: 63,1:2], d=0)
fitM1_CHIS3 <- auto.arima(M1_CHIS_v2[4: 63,2], xreg=M1_CHIS_lags[4: 63,1:3], d=0)
AIC_M1_CHIS <- cbind(fitM1_CHIS1$aic,fitM1_CHIS2$aic,fitM1_CHIS3$aic)
colnames(AIC_M1_CHIS)<-c("1 lag","2 lags", "3 lags")
# CONF - CHIS
CONF_CHIS_v<-as.vector(CONF_CHIS)
CV_CHIS_v<-as.vector(CV_CHIS)
CONF_CHIS_v2<-cbind(CONF_CHIS_v,CV_CHIS_v)
colnames(CONF_CHIS_v2)<-c("CONF_CHIS","CV_CHIS")
a<- lag(CONF_CHIS_v,0)
x<- lag(CONF_CHIS_v,1)
y<- lag(CONF_CHIS_v,2)
z<- lag(CONF_CHIS_v,3)
CONF_CHIS_lags <- cbind(x,y,z)

fitCONF_CHIS1 <- auto.arima(CONF_CHIS_v2[4: 63,2], xreg=CONF_CHIS_lags[4: 63,1], d=0)
fitCONF_CHIS2 <- auto.arima(CONF_CHIS_v2[4: 63,2], xreg=CONF_CHIS_lags[4: 63,1:2], d=0)
fitCONF_CHIS3 <- auto.arima(CONF_CHIS_v2[4: 63,2], xreg=CONF_CHIS_lags[4: 63,1:3], d=0)
AIC_CONF_CHIS <- cbind(fitCONF_CHIS1$aic,fitCONF_CHIS2$aic,fitCONF_CHIS3$aic)
colnames(AIC_CONF_CHIS)<-c("1 lag","2 lags", "3 lags")

AICs_CHIS<-rbind(AIC_IPV_CHIS,AIC_UNEMP_CHIS,AIC_REM_CHIS,AIC_GDP_CHIS,AIC_INPC_SUB_CHIS,AIC_INPC_E_CHIS
rownames(AICs_CHIS)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_CHIS
```

```
##              1 lag   2 lags   3 lags
## IPV       105.1403 106.0786 107.4145
## DESEMPLEO 102.2081 104.1598 106.1578
## REMESAS   102.4448 104.3857 106.1087
## PIB       104.9927 106.7274 108.1554
## INPC_SUB  104.9965 102.0754 104.0598
## INPC_E    104.8901 106.7527 108.7438
## M1        105.0123 105.7815 106.3201
## CONF      104.5982 106.4430 107.9216
```

```r
# COAH
# IPV - COAH
IPV_COAH_v<-as.vector(IPV_COAH)
CV_COAH_v<-as.vector(CV_COAH)
IPV_COAH_v2<-cbind(IPV_COAH_v,CV_COAH_v)
colnames(IPV_COAH_v2)<-c("IPV_COAH","CV_COAH")
a<- lag(IPV_COAH_v,0)
x<- lag(IPV_COAH_v,1)
y<- lag(IPV_COAH_v,2)
z<- lag(IPV_COAH_v,3)
IPV_COAH_lags <- cbind(x,y,z)

fitIPV_COAH1 <- auto.arima(IPV_COAH_v2[4: 63,2], xreg=IPV_COAH_lags[4: 63,1], d=0)
fitIPV_COAH2 <- auto.arima(IPV_COAH_v2[4: 63,2], xreg=IPV_COAH_lags[4: 63,1:2], d=0)
fitIPV_COAH3 <- auto.arima(IPV_COAH_v2[4: 63,2], xreg=IPV_COAH_lags[4: 63,1:3], d=0)
```

```
AIC_IPV_COAH <- cbind(fitIPV_COAH1$aic,fitIPV_COAH2$aic,fitIPV_COAH3$aic)
colnames(AIC_IPV_COAH)<-c("1 lag","2 lags", "3 lags")
# UNEMP - COAH
UNEMP_COAH_v<-as.vector(UNEMP_COAH)
CV_COAH_v<-as.vector(CV_COAH)
UNEMP_COAH_v2<-cbind(UNEMP_COAH_v,CV_COAH_v)
colnames(UNEMP_COAH_v2)<-c("UNEMP_COAH","CV_COAH")
a<- lag(UNEMP_COAH_v,0)
x<- lag(UNEMP_COAH_v,1)
y<- lag(UNEMP_COAH_v,2)
z<- lag(UNEMP_COAH_v,3)
UNEMP_COAH_lags <- cbind(x,y,z)

fitUNEMP_COAH1 <- auto.arima(UNEMP_COAH_v2[4: 63,2], xreg=UNEMP_COAH_lags[4: 63,1], d=0)
fitUNEMP_COAH2 <- auto.arima(UNEMP_COAH_v2[4: 63,2], xreg=UNEMP_COAH_lags[4: 63,1:2], d=0)
fitUNEMP_COAH3 <- auto.arima(UNEMP_COAH_v2[4: 63,2], xreg=UNEMP_COAH_lags[4: 63,1:3], d=0)
AIC_UNEMP_COAH <- cbind(fitUNEMP_COAH1$aic,fitUNEMP_COAH2$aic,fitUNEMP_COAH3$aic)
colnames(AIC_UNEMP_COAH)<-c("1 lag","2 lags", "3 lags")
# REM - COAH
REM_COAH_v<-as.vector(REM_COAH)
CV_COAH_v<-as.vector(CV_COAH)
REM_COAH_v2<-cbind(REM_COAH_v,CV_COAH_v)
colnames(REM_COAH_v2)<-c("REM_COAH","CV_COAH")
a<- lag(REM_COAH_v,0)
x<- lag(REM_COAH_v,1)
y<- lag(REM_COAH_v,2)
z<- lag(REM_COAH_v,3)
REM_COAH_lags <- cbind(x,y,z)

fitREM_COAH1 <- auto.arima(REM_COAH_v2[4: 63,2], xreg=REM_COAH_lags[4: 63,1], d=0)
fitREM_COAH2 <- auto.arima(REM_COAH_v2[4: 63,2], xreg=REM_COAH_lags[4: 63,1:2], d=0)
fitREM_COAH3 <- auto.arima(REM_COAH_v2[4: 63,2], xreg=REM_COAH_lags[4: 63,1:3], d=0)
AIC_REM_COAH <- cbind(fitREM_COAH1$aic,fitREM_COAH2$aic,fitREM_COAH3$aic)
colnames(AIC_REM_COAH)<-c("1 lag","2 lags", "3 lags")
# GDP - COAH
GDP_COAH_v<-as.vector(GDP_COAH)
CV_COAH_v<-as.vector(CV_COAH)
GDP_COAH_v2<-cbind(GDP_COAH_v,CV_COAH_v)
colnames(GDP_COAH_v2)<-c("GDP_COAH","CV_COAH")
a<- lag(GDP_COAH_v,0)
x<- lag(GDP_COAH_v,1)
y<- lag(GDP_COAH_v,2)
z<- lag(GDP_COAH_v,3)
GDP_COAH_lags <- cbind(x,y,z)

fitGDP_COAH1 <- auto.arima(GDP_COAH_v2[4: 63,2], xreg=GDP_COAH_lags[4: 63,1], d=0)
fitGDP_COAH2 <- auto.arima(GDP_COAH_v2[4: 63,2], xreg=GDP_COAH_lags[4: 63,1:2], d=0)
fitGDP_COAH3 <- auto.arima(GDP_COAH_v2[4: 63,2], xreg=GDP_COAH_lags[4: 63,1:3], d=0)
AIC_GDP_COAH <- cbind(fitGDP_COAH1$aic,fitGDP_COAH2$aic,fitGDP_COAH3$aic)
colnames(AIC_GDP_COAH)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - COAH
INPC_SUB_COAH_v<-as.vector(INPC_SUB_COAH)
CV_COAH_v<-as.vector(CV_COAH)
```

```
INPC_SUB_COAH_v2<-cbind(INPC_SUB_COAH_v,CV_COAH_v)
colnames(INPC_SUB_COAH_v2)<-c("INPC_SUB_COAH","CV_COAH")
a<- lag(INPC_SUB_COAH_v,0)
x<- lag(INPC_SUB_COAH_v,1)
y<- lag(INPC_SUB_COAH_v,2)
z<- lag(INPC_SUB_COAH_v,3)
INPC_SUB_COAH_lags <- cbind(x,y,z)

fitINPC_SUB_COAH1 <- auto.arima(INPC_SUB_COAH_v2[4: 63,2], xreg=INPC_SUB_COAH_lags[4: 63,1], d=0)
fitINPC_SUB_COAH2 <- auto.arima(INPC_SUB_COAH_v2[4: 63,2], xreg=INPC_SUB_COAH_lags[4: 63,1:2], d=0)
fitINPC_SUB_COAH3 <- auto.arima(INPC_SUB_COAH_v2[4: 63,2], xreg=INPC_SUB_COAH_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_COAH <- cbind(fitINPC_SUB_COAH1$aic,fitINPC_SUB_COAH2$aic,fitINPC_SUB_COAH3$aic)
colnames(AIC_INPC_SUB_COAH)<-c("1 lag","2 lags", "3 lags")
# INPC_E - COAH
INPC_E_COAH_v<-as.vector(INPC_E_COAH)
CV_COAH_v<-as.vector(CV_COAH)
INPC_E_COAH_v2<-cbind(INPC_E_COAH_v,CV_COAH_v)
colnames(INPC_E_COAH_v2)<-c("INPC_E_COAH","CV_COAH")
a<- lag(INPC_E_COAH_v,0)
x<- lag(INPC_E_COAH_v,1)
y<- lag(INPC_E_COAH_v,2)
z<- lag(INPC_E_COAH_v,3)
INPC_E_COAH_lags <- cbind(x,y,z)

fitINPC_E_COAH1 <- auto.arima(INPC_E_COAH_v2[4: 63,2], xreg=INPC_E_COAH_lags[4: 63,1], d=0)
fitINPC_E_COAH2 <- auto.arima(INPC_E_COAH_v2[4: 63,2], xreg=INPC_E_COAH_lags[4: 63,1:2], d=0)
fitINPC_E_COAH3 <- auto.arima(INPC_E_COAH_v2[4: 63,2], xreg=INPC_E_COAH_lags[4: 63,1:3], d=0)
AIC_INPC_E_COAH <- cbind(fitINPC_E_COAH1$aic,fitINPC_E_COAH2$aic,fitINPC_E_COAH3$aic)
colnames(AIC_INPC_E_COAH)<-c("1 lag","2 lags", "3 lags")
# M1 - COAH
M1_COAH_v<-as.vector(M1_COAH)
CV_COAH_v<-as.vector(CV_COAH)
M1_COAH_v2<-cbind(M1_COAH_v,CV_COAH_v)
colnames(M1_COAH_v2)<-c("M1_COAH","CV_COAH")
a<- lag(M1_COAH_v,0)
x<- lag(M1_COAH_v,1)
y<- lag(M1_COAH_v,2)
z<- lag(M1_COAH_v,3)
M1_COAH_lags <- cbind(x,y,z)

fitM1_COAH1 <- auto.arima(M1_COAH_v2[4: 63,2], xreg=M1_COAH_lags[4: 63,1], d=0)
fitM1_COAH2 <- auto.arima(M1_COAH_v2[4: 63,2], xreg=M1_COAH_lags[4: 63,1:2], d=0)
fitM1_COAH3 <- auto.arima(M1_COAH_v2[4: 63,2], xreg=M1_COAH_lags[4: 63,1:3], d=0)
AIC_M1_COAH <- cbind(fitM1_COAH1$aic,fitM1_COAH2$aic,fitM1_COAH3$aic)
colnames(AIC_M1_COAH)<-c("1 lag","2 lags", "3 lags")
# CONF - COAH
CONF_COAH_v<-as.vector(CONF_COAH)
CV_COAH_v<-as.vector(CV_COAH)
CONF_COAH_v2<-cbind(CONF_COAH_v,CV_COAH_v)
colnames(CONF_COAH_v2)<-c("CONF_COAH","CV_COAH")
a<- lag(CONF_COAH_v,0)
x<- lag(CONF_COAH_v,1)
y<- lag(CONF_COAH_v,2)
```

```
z<- lag(CONF_COAH_v,3)
CONF_COAH_lags <- cbind(x,y,z)

fitCONF_COAH1 <- auto.arima(CONF_COAH_v2[4: 63,2], xreg=CONF_COAH_lags[4: 63,1], d=0)
fitCONF_COAH2 <- auto.arima(CONF_COAH_v2[4: 63,2], xreg=CONF_COAH_lags[4: 63,1:2], d=0)
fitCONF_COAH3 <- auto.arima(CONF_COAH_v2[4: 63,2], xreg=CONF_COAH_lags[4: 63,1:3], d=0)
AIC_CONF_COAH <- cbind(fitCONF_COAH1$aic,fitCONF_COAH2$aic,fitCONF_COAH3$aic)
colnames(AIC_CONF_COAH)<-c("1 lag","2 lags", "3 lags")

AICs_COAH<-rbind(AIC_IPV_COAH,AIC_UNEMP_COAH,AIC_REM_COAH,AIC_GDP_COAH,AIC_INPC_SUB_COAH,AIC_INPC_E_COAH
rownames(AICs_COAH)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_COAH
```

```
##              1 lag   2 lags   3 lags
## IPV       65.48841 67.42923 69.34933
## DESEMPLEO 65.84876 65.51894 67.51741
## REMESAS   65.89895 67.26940 68.40500
## PIB       65.97402 67.87728 69.71789
## INPC_SUB  64.32247 65.51533 67.04130
## INPC_E    64.88743 66.77217 68.71534
## M1        65.15005 66.62217 68.42346
## CONF      65.83302 67.82295 69.06153
```

```
# COL
# IPV - COL
IPV_COL_v<-as.vector(IPV_COL)
CV_COL_v<-as.vector(CV_COL)
IPV_COL_v2<-cbind(IPV_COL_v,CV_COL_v)
colnames(IPV_COL_v2)<-c("IPV_COL","CV_COL")
a<- lag(IPV_COL_v,0)
x<- lag(IPV_COL_v,1)
y<- lag(IPV_COL_v,2)
z<- lag(IPV_COL_v,3)
IPV_COL_lags <- cbind(x,y,z)

fitIPV_COL1 <- auto.arima(IPV_COL_v2[4: 63,2], xreg=IPV_COL_lags[4: 63,1], d=0)
fitIPV_COL2 <- auto.arima(IPV_COL_v2[4: 63,2], xreg=IPV_COL_lags[4: 63,1:2], d=0)
fitIPV_COL3 <- auto.arima(IPV_COL_v2[4: 63,2], xreg=IPV_COL_lags[4: 63,1:3], d=0)
AIC_IPV_COL <- cbind(fitIPV_COL1$aic,fitIPV_COL2$aic,fitIPV_COL3$aic)
colnames(AIC_IPV_COL)<-c("1 lag","2 lags", "3 lags")
# UNEMP - COL
UNEMP_COL_v<-as.vector(UNEMP_COL)
CV_COL_v<-as.vector(CV_COL)
UNEMP_COL_v2<-cbind(UNEMP_COL_v,CV_COL_v)
colnames(UNEMP_COL_v2)<-c("UNEMP_COL","CV_COL")
a<- lag(UNEMP_COL_v,0)
x<- lag(UNEMP_COL_v,1)
y<- lag(UNEMP_COL_v,2)
z<- lag(UNEMP_COL_v,3)
UNEMP_COL_lags <- cbind(x,y,z)

fitUNEMP_COL1 <- auto.arima(UNEMP_COL_v2[4: 63,2], xreg=UNEMP_COL_lags[4: 63,1], d=0)
fitUNEMP_COL2 <- auto.arima(UNEMP_COL_v2[4: 63,2], xreg=UNEMP_COL_lags[4: 63,1:2], d=0)
```

```
fitUNEMP_COL3 <- auto.arima(UNEMP_COL_v2[4: 63,2], xreg=UNEMP_COL_lags[4: 63,1:3], d=0)
AIC_UNEMP_COL <- cbind(fitUNEMP_COL1$aic,fitUNEMP_COL2$aic,fitUNEMP_COL3$aic)
colnames(AIC_UNEMP_COL)<-c("1 lag","2 lags", "3 lags")
# REM - COL
REM_COL_v<-as.vector(REM_COL)
CV_COL_v<-as.vector(CV_COL)
REM_COL_v2<-cbind(REM_COL_v,CV_COL_v)
colnames(REM_COL_v2)<-c("REM_COL","CV_COL")
a<- lag(REM_COL_v,0)
x<- lag(REM_COL_v,1)
y<- lag(REM_COL_v,2)
z<- lag(REM_COL_v,3)
REM_COL_lags <- cbind(x,y,z)

fitREM_COL1 <- auto.arima(REM_COL_v2[4: 63,2], xreg=REM_COL_lags[4: 63,1], d=0)
fitREM_COL2 <- auto.arima(REM_COL_v2[4: 63,2], xreg=REM_COL_lags[4: 63,1:2], d=0)
fitREM_COL3 <- auto.arima(REM_COL_v2[4: 63,2], xreg=REM_COL_lags[4: 63,1:3], d=0)
AIC_REM_COL <- cbind(fitREM_COL1$aic,fitREM_COL2$aic,fitREM_COL3$aic)
colnames(AIC_REM_COL)<-c("1 lag","2 lags", "3 lags")
# GDP - COL
GDP_COL_v<-as.vector(GDP_COL)
CV_COL_v<-as.vector(CV_COL)
GDP_COL_v2<-cbind(GDP_COL_v,CV_COL_v)
colnames(GDP_COL_v2)<-c("GDP_COL","CV_COL")
a<- lag(GDP_COL_v,0)
x<- lag(GDP_COL_v,1)
y<- lag(GDP_COL_v,2)
z<- lag(GDP_COL_v,3)
GDP_COL_lags <- cbind(x,y,z)

fitGDP_COL1 <- auto.arima(GDP_COL_v2[4: 63,2], xreg=GDP_COL_lags[4: 63,1], d=0)
fitGDP_COL2 <- auto.arima(GDP_COL_v2[4: 63,2], xreg=GDP_COL_lags[4: 63,1:2], d=0)
fitGDP_COL3 <- auto.arima(GDP_COL_v2[4: 63,2], xreg=GDP_COL_lags[4: 63,1:3], d=0)
AIC_GDP_COL <- cbind(fitGDP_COL1$aic,fitGDP_COL2$aic,fitGDP_COL3$aic)
colnames(AIC_GDP_COL)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - COL
INPC_SUB_COL_v<-as.vector(INPC_SUB_COL)
CV_COL_v<-as.vector(CV_COL)
INPC_SUB_COL_v2<-cbind(INPC_SUB_COL_v,CV_COL_v)
colnames(INPC_SUB_COL_v2)<-c("INPC_SUB_COL","CV_COL")
a<- lag(INPC_SUB_COL_v,0)
x<- lag(INPC_SUB_COL_v,1)
y<- lag(INPC_SUB_COL_v,2)
z<- lag(INPC_SUB_COL_v,3)
INPC_SUB_COL_lags <- cbind(x,y,z)

fitINPC_SUB_COL1 <- auto.arima(INPC_SUB_COL_v2[4: 63,2], xreg=INPC_SUB_COL_lags[4: 63,1], d=0)
fitINPC_SUB_COL2 <- auto.arima(INPC_SUB_COL_v2[4: 63,2], xreg=INPC_SUB_COL_lags[4: 63,1:2], d=0)
fitINPC_SUB_COL3 <- auto.arima(INPC_SUB_COL_v2[4: 63,2], xreg=INPC_SUB_COL_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_COL <- cbind(fitINPC_SUB_COL1$aic,fitINPC_SUB_COL2$aic,fitINPC_SUB_COL3$aic)
colnames(AIC_INPC_SUB_COL)<-c("1 lag","2 lags", "3 lags")
# INPC_E - COL
INPC_E_COL_v<-as.vector(INPC_E_COL)
```

```
CV_COL_v<-as.vector(CV_COL)
INPC_E_COL_v2<-cbind(INPC_E_COL_v,CV_COL_v)
colnames(INPC_E_COL_v2)<-c("INPC_E_COL","CV_COL")
a<- lag(INPC_E_COL_v,0)
x<- lag(INPC_E_COL_v,1)
y<- lag(INPC_E_COL_v,2)
z<- lag(INPC_E_COL_v,3)
INPC_E_COL_lags <- cbind(x,y,z)

fitINPC_E_COL1 <- auto.arima(INPC_E_COL_v2[4: 63,2], xreg=INPC_E_COL_lags[4: 63,1], d=0)
fitINPC_E_COL2 <- auto.arima(INPC_E_COL_v2[4: 63,2], xreg=INPC_E_COL_lags[4: 63,1:2], d=0)
fitINPC_E_COL3 <- auto.arima(INPC_E_COL_v2[4: 63,2], xreg=INPC_E_COL_lags[4: 63,1:3], d=0)
AIC_INPC_E_COL <- cbind(fitINPC_E_COL1$aic,fitINPC_E_COL2$aic,fitINPC_E_COL3$aic)
colnames(AIC_INPC_E_COL)<-c("1 lag","2 lags", "3 lags")
# M1 - COL
M1_COL_v<-as.vector(M1_COL)
CV_COL_v<-as.vector(CV_COL)
M1_COL_v2<-cbind(M1_COL_v,CV_COL_v)
colnames(M1_COL_v2)<-c("M1_COL","CV_COL")
a<- lag(M1_COL_v,0)
x<- lag(M1_COL_v,1)
y<- lag(M1_COL_v,2)
z<- lag(M1_COL_v,3)
M1_COL_lags <- cbind(x,y,z)

fitM1_COL1 <- auto.arima(M1_COL_v2[4: 63,2], xreg=M1_COL_lags[4: 63,1], d=0)
fitM1_COL2 <- auto.arima(M1_COL_v2[4: 63,2], xreg=M1_COL_lags[4: 63,1:2], d=0)
fitM1_COL3 <- auto.arima(M1_COL_v2[4: 63,2], xreg=M1_COL_lags[4: 63,1:3], d=0)
AIC_M1_COL <- cbind(fitM1_COL1$aic,fitM1_COL2$aic,fitM1_COL3$aic)
colnames(AIC_M1_COL)<-c("1 lag","2 lags", "3 lags")
# CONF - COL
CONF_COL_v<-as.vector(CONF_COL)
CV_COL_v<-as.vector(CV_COL)
CONF_COL_v2<-cbind(CONF_COL_v,CV_COL_v)
colnames(CONF_COL_v2)<-c("CONF_COL","CV_COL")
a<- lag(CONF_COL_v,0)
x<- lag(CONF_COL_v,1)
y<- lag(CONF_COL_v,2)
z<- lag(CONF_COL_v,3)
CONF_COL_lags <- cbind(x,y,z)

fitCONF_COL1 <- auto.arima(CONF_COL_v2[4: 63,2], xreg=CONF_COL_lags[4: 63,1], d=0)
fitCONF_COL2 <- auto.arima(CONF_COL_v2[4: 63,2], xreg=CONF_COL_lags[4: 63,1:2], d=0)
fitCONF_COL3 <- auto.arima(CONF_COL_v2[4: 63,2], xreg=CONF_COL_lags[4: 63,1:3], d=0)
AIC_CONF_COL <- cbind(fitCONF_COL1$aic,fitCONF_COL2$aic,fitCONF_COL3$aic)
colnames(AIC_CONF_COL)<-c("1 lag","2 lags", "3 lags")

AICs_COL<-rbind(AIC_IPV_COL,AIC_UNEMP_COL,AIC_REM_COL,AIC_GDP_COL,AIC_INPC_SUB_COL,AIC_INPC_E_COL,AIC_M
rownames(AICs_COL)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_COL
```

```
##             1 lag   2 lags   3 lags
## IPV      83.33289 85.08630 85.60212
```

```
## DESEMPLEO 84.60872 85.13842 86.41573
## REMESAS   81.83657 83.19498 85.12687
## PIB       86.31380 86.23379 88.15040
## INPC_SUB  84.99540 84.51404 82.39490
## INPC_E    80.58734 81.90514 83.24507
## M1        85.74124 82.16377 82.15560
## CONF      86.13574 87.94777 88.81675
```

```
# DGO
# IPV - DGO
IPV_DGO_v<-as.vector(IPV_DGO)
CV_DGO_v<-as.vector(CV_DGO)
IPV_DGO_v2<-cbind(IPV_DGO_v,CV_DGO_v)
colnames(IPV_DGO_v2)<-c("IPV_DGO","CV_DGO")
a<- lag(IPV_DGO_v,0)
x<- lag(IPV_DGO_v,1)
y<- lag(IPV_DGO_v,2)
z<- lag(IPV_DGO_v,3)
IPV_DGO_lags <- cbind(x,y,z)

fitIPV_DGO1 <- auto.arima(IPV_DGO_v2[4: 63,2], xreg=IPV_DGO_lags[4: 63,1], d=0)
fitIPV_DGO2 <- auto.arima(IPV_DGO_v2[4: 63,2], xreg=IPV_DGO_lags[4: 63,1:2], d=0)
fitIPV_DGO3 <- auto.arima(IPV_DGO_v2[4: 63,2], xreg=IPV_DGO_lags[4: 63,1:3], d=0)
AIC_IPV_DGO <- cbind(fitIPV_DGO1$aic,fitIPV_DGO2$aic,fitIPV_DGO3$aic)
colnames(AIC_IPV_DGO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - DGO
UNEMP_DGO_v<-as.vector(UNEMP_DGO)
CV_DGO_v<-as.vector(CV_DGO)
UNEMP_DGO_v2<-cbind(UNEMP_DGO_v,CV_DGO_v)
colnames(UNEMP_DGO_v2)<-c("UNEMP_DGO","CV_DGO")
a<- lag(UNEMP_DGO_v,0)
x<- lag(UNEMP_DGO_v,1)
y<- lag(UNEMP_DGO_v,2)
z<- lag(UNEMP_DGO_v,3)
UNEMP_DGO_lags <- cbind(x,y,z)

fitUNEMP_DGO1 <- auto.arima(UNEMP_DGO_v2[4: 63,2], xreg=UNEMP_DGO_lags[4: 63,1], d=0)
fitUNEMP_DGO2 <- auto.arima(UNEMP_DGO_v2[4: 63,2], xreg=UNEMP_DGO_lags[4: 63,1:2], d=0)
fitUNEMP_DGO3 <- auto.arima(UNEMP_DGO_v2[4: 63,2], xreg=UNEMP_DGO_lags[4: 63,1:3], d=0)
AIC_UNEMP_DGO <- cbind(fitUNEMP_DGO1$aic,fitUNEMP_DGO2$aic,fitUNEMP_DGO3$aic)
colnames(AIC_UNEMP_DGO)<-c("1 lag","2 lags", "3 lags")
# REM - DGO
REM_DGO_v<-as.vector(REM_DGO)
CV_DGO_v<-as.vector(CV_DGO)
REM_DGO_v2<-cbind(REM_DGO_v,CV_DGO_v)
colnames(REM_DGO_v2)<-c("REM_DGO","CV_DGO")
a<- lag(REM_DGO_v,0)
x<- lag(REM_DGO_v,1)
y<- lag(REM_DGO_v,2)
z<- lag(REM_DGO_v,3)
REM_DGO_lags <- cbind(x,y,z)

fitREM_DGO1 <- auto.arima(REM_DGO_v2[4: 63,2], xreg=REM_DGO_lags[4: 63,1], d=0)
fitREM_DGO2 <- auto.arima(REM_DGO_v2[4: 63,2], xreg=REM_DGO_lags[4: 63,1:2], d=0)
```

```
fitREM_DGO3 <- auto.arima(REM_DGO_v2[4: 63,2], xreg=REM_DGO_lags[4: 63,1:3], d=0)
AIC_REM_DGO <- cbind(fitREM_DGO1$aic,fitREM_DGO2$aic,fitREM_DGO3$aic)
colnames(AIC_REM_DGO)<-c("1 lag","2 lags", "3 lags")
# GDP - DGO
GDP_DGO_v<-as.vector(GDP_DGO)
CV_DGO_v<-as.vector(CV_DGO)
GDP_DGO_v2<-cbind(GDP_DGO_v,CV_DGO_v)
colnames(GDP_DGO_v2)<-c("GDP_DGO","CV_DGO")
a<- lag(GDP_DGO_v,0)
x<- lag(GDP_DGO_v,1)
y<- lag(GDP_DGO_v,2)
z<- lag(GDP_DGO_v,3)
GDP_DGO_lags <- cbind(x,y,z)

fitGDP_DGO1 <- auto.arima(GDP_DGO_v2[4: 63,2], xreg=GDP_DGO_lags[4: 63,1], d=0)
fitGDP_DGO2 <- auto.arima(GDP_DGO_v2[4: 63,2], xreg=GDP_DGO_lags[4: 63,1:2], d=0)
fitGDP_DGO3 <- auto.arima(GDP_DGO_v2[4: 63,2], xreg=GDP_DGO_lags[4: 63,1:3], d=0)
AIC_GDP_DGO <- cbind(fitGDP_DGO1$aic,fitGDP_DGO2$aic,fitGDP_DGO3$aic)
colnames(AIC_GDP_DGO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - DGO
INPC_SUB_DGO_v<-as.vector(INPC_SUB_DGO)
CV_DGO_v<-as.vector(CV_DGO)
INPC_SUB_DGO_v2<-cbind(INPC_SUB_DGO_v,CV_DGO_v)
colnames(INPC_SUB_DGO_v2)<-c("INPC_SUB_DGO","CV_DGO")
a<- lag(INPC_SUB_DGO_v,0)
x<- lag(INPC_SUB_DGO_v,1)
y<- lag(INPC_SUB_DGO_v,2)
z<- lag(INPC_SUB_DGO_v,3)
INPC_SUB_DGO_lags <- cbind(x,y,z)

fitINPC_SUB_DGO1 <- auto.arima(INPC_SUB_DGO_v2[4: 63,2], xreg=INPC_SUB_DGO_lags[4: 63,1], d=0)
fitINPC_SUB_DGO2 <- auto.arima(INPC_SUB_DGO_v2[4: 63,2], xreg=INPC_SUB_DGO_lags[4: 63,1:2], d=0)
fitINPC_SUB_DGO3 <- auto.arima(INPC_SUB_DGO_v2[4: 63,2], xreg=INPC_SUB_DGO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_DGO <- cbind(fitINPC_SUB_DGO1$aic,fitINPC_SUB_DGO2$aic,fitINPC_SUB_DGO3$aic)
colnames(AIC_INPC_SUB_DGO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - DGO
INPC_E_DGO_v<-as.vector(INPC_E_DGO)
CV_DGO_v<-as.vector(CV_DGO)
INPC_E_DGO_v2<-cbind(INPC_E_DGO_v,CV_DGO_v)
colnames(INPC_E_DGO_v2)<-c("INPC_E_DGO","CV_DGO")
a<- lag(INPC_E_DGO_v,0)
x<- lag(INPC_E_DGO_v,1)
y<- lag(INPC_E_DGO_v,2)
z<- lag(INPC_E_DGO_v,3)
INPC_E_DGO_lags <- cbind(x,y,z)

fitINPC_E_DGO1 <- auto.arima(INPC_E_DGO_v2[4: 63,2], xreg=INPC_E_DGO_lags[4: 63,1], d=0)
fitINPC_E_DGO2 <- auto.arima(INPC_E_DGO_v2[4: 63,2], xreg=INPC_E_DGO_lags[4: 63,1:2], d=0)
fitINPC_E_DGO3 <- auto.arima(INPC_E_DGO_v2[4: 63,2], xreg=INPC_E_DGO_lags[4: 63,1:3], d=0)
AIC_INPC_E_DGO <- cbind(fitINPC_E_DGO1$aic,fitINPC_E_DGO2$aic,fitINPC_E_DGO3$aic)
colnames(AIC_INPC_E_DGO)<-c("1 lag","2 lags", "3 lags")
# M1 - DGO
M1_DGO_v<-as.vector(M1_DGO)
```

```
CV_DGO_v<-as.vector(CV_DGO)
M1_DGO_v2<-cbind(M1_DGO_v,CV_DGO_v)
colnames(M1_DGO_v2)<-c("M1_DGO","CV_DGO")
a<- lag(M1_DGO_v,0)
x<- lag(M1_DGO_v,1)
y<- lag(M1_DGO_v,2)
z<- lag(M1_DGO_v,3)
M1_DGO_lags <- cbind(x,y,z)

fitM1_DGO1 <- auto.arima(M1_DGO_v2[4: 63,2], xreg=M1_DGO_lags[4: 63,1], d=0)
fitM1_DGO2 <- auto.arima(M1_DGO_v2[4: 63,2], xreg=M1_DGO_lags[4: 63,1:2], d=0)
fitM1_DGO3 <- auto.arima(M1_DGO_v2[4: 63,2], xreg=M1_DGO_lags[4: 63,1:3], d=0)
AIC_M1_DGO <- cbind(fitM1_DGO1$aic,fitM1_DGO2$aic,fitM1_DGO3$aic)
colnames(AIC_M1_DGO)<-c("1 lag","2 lags", "3 lags")
# CONF - DGO
CONF_DGO_v<-as.vector(CONF_DGO)
CV_DGO_v<-as.vector(CV_DGO)
CONF_DGO_v2<-cbind(CONF_DGO_v,CV_DGO_v)
colnames(CONF_DGO_v2)<-c("CONF_DGO","CV_DGO")
a<- lag(CONF_DGO_v,0)
x<- lag(CONF_DGO_v,1)
y<- lag(CONF_DGO_v,2)
z<- lag(CONF_DGO_v,3)
CONF_DGO_lags <- cbind(x,y,z)

fitCONF_DGO1 <- auto.arima(CONF_DGO_v2[4: 63,2], xreg=CONF_DGO_lags[4: 63,1], d=0)
fitCONF_DGO2 <- auto.arima(CONF_DGO_v2[4: 63,2], xreg=CONF_DGO_lags[4: 63,1:2], d=0)
fitCONF_DGO3 <- auto.arima(CONF_DGO_v2[4: 63,2], xreg=CONF_DGO_lags[4: 63,1:3], d=0)
AIC_CONF_DGO <- cbind(fitCONF_DGO1$aic,fitCONF_DGO2$aic,fitCONF_DGO3$aic)
colnames(AIC_CONF_DGO)<-c("1 lag","2 lags", "3 lags")

AICs_DGO<-rbind(AIC_IPV_DGO,AIC_UNEMP_DGO,AIC_REM_DGO,AIC_GDP_DGO,AIC_INPC_SUB_DGO,AIC_INPC_E_DGO,AIC_M
rownames(AICs_DGO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_DGO
```

```
##              1 lag   2 lags   3 lags
## IPV       92.97268 91.38020 92.98246
## DESEMPLEO 94.19097 96.17992 97.07507
## REMESAS   94.39786 96.24892 98.15329
## PIB       93.06696 94.48892 94.08636
## INPC_SUB  93.58308 91.74931 93.70062
## INPC_E    92.78789 94.55715 96.22798
## M1        94.44307 95.52677 94.94060
## CONF      93.11587 94.93256 95.27697
```

```
# GRO
# IPV - GRO
IPV_GRO_v<-as.vector(IPV_GRO)
CV_GRO_v<-as.vector(CV_GRO)
IPV_GRO_v2<-cbind(IPV_GRO_v,CV_GRO_v)
colnames(IPV_GRO_v2)<-c("IPV_GRO","CV_GRO")
a<- lag(IPV_GRO_v,0)
x<- lag(IPV_GRO_v,1)
```

```
y<- lag(IPV_GRO_v,2)
z<- lag(IPV_GRO_v,3)
IPV_GRO_lags <- cbind(x,y,z)

fitIPV_GRO1 <- auto.arima(IPV_GRO_v2[4: 63,2], xreg=IPV_GRO_lags[4: 63,1], d=0)
fitIPV_GRO2 <- auto.arima(IPV_GRO_v2[4: 63,2], xreg=IPV_GRO_lags[4: 63,1:2], d=0)
fitIPV_GRO3 <- auto.arima(IPV_GRO_v2[4: 63,2], xreg=IPV_GRO_lags[4: 63,1:3], d=0)
AIC_IPV_GRO <- cbind(fitIPV_GRO1$aic,fitIPV_GRO2$aic,fitIPV_GRO3$aic)
colnames(AIC_IPV_GRO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - GRO
UNEMP_GRO_v<-as.vector(UNEMP_GRO)
CV_GRO_v<-as.vector(CV_GRO)
UNEMP_GRO_v2<-cbind(UNEMP_GRO_v,CV_GRO_v)
colnames(UNEMP_GRO_v2)<-c("UNEMP_GRO","CV_GRO")
a<- lag(UNEMP_GRO_v,0)
x<- lag(UNEMP_GRO_v,1)
y<- lag(UNEMP_GRO_v,2)
z<- lag(UNEMP_GRO_v,3)
UNEMP_GRO_lags <- cbind(x,y,z)

fitUNEMP_GRO1 <- auto.arima(UNEMP_GRO_v2[4: 63,2], xreg=UNEMP_GRO_lags[4: 63,1], d=0)
fitUNEMP_GRO2 <- auto.arima(UNEMP_GRO_v2[4: 63,2], xreg=UNEMP_GRO_lags[4: 63,1:2], d=0)
fitUNEMP_GRO3 <- auto.arima(UNEMP_GRO_v2[4: 63,2], xreg=UNEMP_GRO_lags[4: 63,1:3], d=0)
AIC_UNEMP_GRO <- cbind(fitUNEMP_GRO1$aic,fitUNEMP_GRO2$aic,fitUNEMP_GRO3$aic)
colnames(AIC_UNEMP_GRO)<-c("1 lag","2 lags", "3 lags")
# REM - GRO
REM_GRO_v<-as.vector(REM_GRO)
CV_GRO_v<-as.vector(CV_GRO)
REM_GRO_v2<-cbind(REM_GRO_v,CV_GRO_v)
colnames(REM_GRO_v2)<-c("REM_GRO","CV_GRO")
a<- lag(REM_GRO_v,0)
x<- lag(REM_GRO_v,1)
y<- lag(REM_GRO_v,2)
z<- lag(REM_GRO_v,3)
REM_GRO_lags <- cbind(x,y,z)

fitREM_GRO1 <- auto.arima(REM_GRO_v2[4: 63,2], xreg=REM_GRO_lags[4: 63,1], d=0)
fitREM_GRO2 <- auto.arima(REM_GRO_v2[4: 63,2], xreg=REM_GRO_lags[4: 63,1:2], d=0)
fitREM_GRO3 <- auto.arima(REM_GRO_v2[4: 63,2], xreg=REM_GRO_lags[4: 63,1:3], d=0)
AIC_REM_GRO <- cbind(fitREM_GRO1$aic,fitREM_GRO2$aic,fitREM_GRO3$aic)
colnames(AIC_REM_GRO)<-c("1 lag","2 lags", "3 lags")
# GDP - GRO
GDP_GRO_v<-as.vector(GDP_GRO)
CV_GRO_v<-as.vector(CV_GRO)
GDP_GRO_v2<-cbind(GDP_GRO_v,CV_GRO_v)
colnames(GDP_GRO_v2)<-c("GDP_GRO","CV_GRO")
a<- lag(GDP_GRO_v,0)
x<- lag(GDP_GRO_v,1)
y<- lag(GDP_GRO_v,2)
z<- lag(GDP_GRO_v,3)
GDP_GRO_lags <- cbind(x,y,z)

fitGDP_GRO1 <- auto.arima(GDP_GRO_v2[4: 63,2], xreg=GDP_GRO_lags[4: 63,1], d=0)
```

```
fitGDP_GRO2 <- auto.arima(GDP_GRO_v2[4: 63,2], xreg=GDP_GRO_lags[4: 63,1:2], d=0)
fitGDP_GRO3 <- auto.arima(GDP_GRO_v2[4: 63,2], xreg=GDP_GRO_lags[4: 63,1:3], d=0)
AIC_GDP_GRO <- cbind(fitGDP_GRO1$aic,fitGDP_GRO2$aic,fitGDP_GRO3$aic)
colnames(AIC_GDP_GRO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - GRO
INPC_SUB_GRO_v<-as.vector(INPC_SUB_GRO)
CV_GRO_v<-as.vector(CV_GRO)
INPC_SUB_GRO_v2<-cbind(INPC_SUB_GRO_v,CV_GRO_v)
colnames(INPC_SUB_GRO_v2)<-c("INPC_SUB_GRO","CV_GRO")
a<- lag(INPC_SUB_GRO_v,0)
x<- lag(INPC_SUB_GRO_v,1)
y<- lag(INPC_SUB_GRO_v,2)
z<- lag(INPC_SUB_GRO_v,3)
INPC_SUB_GRO_lags <- cbind(x,y,z)

fitINPC_SUB_GRO1 <- auto.arima(INPC_SUB_GRO_v2[4: 63,2], xreg=INPC_SUB_GRO_lags[4: 63,1], d=0)
fitINPC_SUB_GRO2 <- auto.arima(INPC_SUB_GRO_v2[4: 63,2], xreg=INPC_SUB_GRO_lags[4: 63,1:2], d=0)
fitINPC_SUB_GRO3 <- auto.arima(INPC_SUB_GRO_v2[4: 63,2], xreg=INPC_SUB_GRO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_GRO <- cbind(fitINPC_SUB_GRO1$aic,fitINPC_SUB_GRO2$aic,fitINPC_SUB_GRO3$aic)
colnames(AIC_INPC_SUB_GRO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - GRO
INPC_E_GRO_v<-as.vector(INPC_E_GRO)
CV_GRO_v<-as.vector(CV_GRO)
INPC_E_GRO_v2<-cbind(INPC_E_GRO_v,CV_GRO_v)
colnames(INPC_E_GRO_v2)<-c("INPC_E_GRO","CV_GRO")
a<- lag(INPC_E_GRO_v,0)
x<- lag(INPC_E_GRO_v,1)
y<- lag(INPC_E_GRO_v,2)
z<- lag(INPC_E_GRO_v,3)
INPC_E_GRO_lags <- cbind(x,y,z)

fitINPC_E_GRO1 <- auto.arima(INPC_E_GRO_v2[4: 63,2], xreg=INPC_E_GRO_lags[4: 63,1], d=0)
fitINPC_E_GRO2 <- auto.arima(INPC_E_GRO_v2[4: 63,2], xreg=INPC_E_GRO_lags[4: 63,1:2], d=0)
fitINPC_E_GRO3 <- auto.arima(INPC_E_GRO_v2[4: 63,2], xreg=INPC_E_GRO_lags[4: 63,1:3], d=0)
AIC_INPC_E_GRO <- cbind(fitINPC_E_GRO1$aic,fitINPC_E_GRO2$aic,fitINPC_E_GRO3$aic)
colnames(AIC_INPC_E_GRO)<-c("1 lag","2 lags", "3 lags")
# M1 - GRO
M1_GRO_v<-as.vector(M1_GRO)
CV_GRO_v<-as.vector(CV_GRO)
M1_GRO_v2<-cbind(M1_GRO_v,CV_GRO_v)
colnames(M1_GRO_v2)<-c("M1_GRO","CV_GRO")
a<- lag(M1_GRO_v,0)
x<- lag(M1_GRO_v,1)
y<- lag(M1_GRO_v,2)
z<- lag(M1_GRO_v,3)
M1_GRO_lags <- cbind(x,y,z)

fitM1_GRO1 <- auto.arima(M1_GRO_v2[4: 63,2], xreg=M1_GRO_lags[4: 63,1], d=0)
fitM1_GRO2 <- auto.arima(M1_GRO_v2[4: 63,2], xreg=M1_GRO_lags[4: 63,1:2], d=0)
fitM1_GRO3 <- auto.arima(M1_GRO_v2[4: 63,2], xreg=M1_GRO_lags[4: 63,1:3], d=0)
AIC_M1_GRO <- cbind(fitM1_GRO1$aic,fitM1_GRO2$aic,fitM1_GRO3$aic)
colnames(AIC_M1_GRO)<-c("1 lag","2 lags", "3 lags")
# CONF - GRO
```

```
CONF_GRO_v<-as.vector(CONF_GRO)
CV_GRO_v<-as.vector(CV_GRO)
CONF_GRO_v2<-cbind(CONF_GRO_v,CV_GRO_v)
colnames(CONF_GRO_v2)<-c("CONF_GRO","CV_GRO")
a<- lag(CONF_GRO_v,0)
x<- lag(CONF_GRO_v,1)
y<- lag(CONF_GRO_v,2)
z<- lag(CONF_GRO_v,3)
CONF_GRO_lags <- cbind(x,y,z)

fitCONF_GRO1 <- auto.arima(CONF_GRO_v2[4: 63,2], xreg=CONF_GRO_lags[4: 63,1], d=0)
fitCONF_GRO2 <- auto.arima(CONF_GRO_v2[4: 63,2], xreg=CONF_GRO_lags[4: 63,1:2], d=0)
fitCONF_GRO3 <- auto.arima(CONF_GRO_v2[4: 63,2], xreg=CONF_GRO_lags[4: 63,1:3], d=0)
AIC_CONF_GRO <- cbind(fitCONF_GRO1$aic,fitCONF_GRO2$aic,fitCONF_GRO3$aic)
colnames(AIC_CONF_GRO)<-c("1 lag","2 lags", "3 lags")

AICs_GRO<-rbind(AIC_IPV_GRO,AIC_UNEMP_GRO,AIC_REM_GRO,AIC_GDP_GRO,AIC_INPC_SUB_GRO,AIC_INPC_E_GRO,AIC_M
rownames(AICs_GRO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_GRO
```

```
##              1 lag   2 lags   3 lags
## IPV       130.7373 132.7022 134.7018
## DESEMPLEO 130.8850 125.9640 127.8410
## REMESAS   131.5970 133.5963 132.2205
## PIB       132.2720 134.2340 133.5587
## INPC_SUB  130.7194 130.5889 132.3862
## INPC_E    129.0333 126.8897 128.0075
## M1        128.6223 130.4989 128.0389
## CONF      132.3610 134.0859 136.0239
```

```
# GTO
# IPV - GTO
IPV_GTO_v<-as.vector(IPV_GTO)
CV_GTO_v<-as.vector(CV_GTO)
IPV_GTO_v2<-cbind(IPV_GTO_v,CV_GTO_v)
colnames(IPV_GTO_v2)<-c("IPV_GTO","CV_GTO")
a<- lag(IPV_GTO_v,0)
x<- lag(IPV_GTO_v,1)
y<- lag(IPV_GTO_v,2)
z<- lag(IPV_GTO_v,3)
IPV_GTO_lags <- cbind(x,y,z)

fitIPV_GTO1 <- auto.arima(IPV_GTO_v2[4: 63,2], xreg=IPV_GTO_lags[4: 63,1], d=0)
fitIPV_GTO2 <- auto.arima(IPV_GTO_v2[4: 63,2], xreg=IPV_GTO_lags[4: 63,1:2], d=0)
fitIPV_GTO3 <- auto.arima(IPV_GTO_v2[4: 63,2], xreg=IPV_GTO_lags[4: 63,1:3], d=0)
AIC_IPV_GTO <- cbind(fitIPV_GTO1$aic,fitIPV_GTO2$aic,fitIPV_GTO3$aic)
colnames(AIC_IPV_GTO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - GTO
UNEMP_GTO_v<-as.vector(UNEMP_GTO)
CV_GTO_v<-as.vector(CV_GTO)
UNEMP_GTO_v2<-cbind(UNEMP_GTO_v,CV_GTO_v)
colnames(UNEMP_GTO_v2)<-c("UNEMP_GTO","CV_GTO")
a<- lag(UNEMP_GTO_v,0)
```

```
x<- lag(UNEMP_GTO_v,1)
y<- lag(UNEMP_GTO_v,2)
z<- lag(UNEMP_GTO_v,3)
UNEMP_GTO_lags <- cbind(x,y,z)

fitUNEMP_GTO1 <- auto.arima(UNEMP_GTO_v2[4: 63,2], xreg=UNEMP_GTO_lags[4: 63,1], d=0)
fitUNEMP_GTO2 <- auto.arima(UNEMP_GTO_v2[4: 63,2], xreg=UNEMP_GTO_lags[4: 63,1:2], d=0)
fitUNEMP_GTO3 <- auto.arima(UNEMP_GTO_v2[4: 63,2], xreg=UNEMP_GTO_lags[4: 63,1:3], d=0)
AIC_UNEMP_GTO <- cbind(fitUNEMP_GTO1$aic,fitUNEMP_GTO2$aic,fitUNEMP_GTO3$aic)
colnames(AIC_UNEMP_GTO)<-c("1 lag","2 lags", "3 lags")
# REM - GTO
REM_GTO_v<-as.vector(REM_GTO)
CV_GTO_v<-as.vector(CV_GTO)
REM_GTO_v2<-cbind(REM_GTO_v,CV_GTO_v)
colnames(REM_GTO_v2)<-c("REM_GTO","CV_GTO")
a<- lag(REM_GTO_v,0)
x<- lag(REM_GTO_v,1)
y<- lag(REM_GTO_v,2)
z<- lag(REM_GTO_v,3)
REM_GTO_lags <- cbind(x,y,z)

fitREM_GTO1 <- auto.arima(REM_GTO_v2[4: 63,2], xreg=REM_GTO_lags[4: 63,1], d=0)
fitREM_GTO2 <- auto.arima(REM_GTO_v2[4: 63,2], xreg=REM_GTO_lags[4: 63,1:2], d=0)
fitREM_GTO3 <- auto.arima(REM_GTO_v2[4: 63,2], xreg=REM_GTO_lags[4: 63,1:3], d=0)
AIC_REM_GTO <- cbind(fitREM_GTO1$aic,fitREM_GTO2$aic,fitREM_GTO3$aic)
colnames(AIC_REM_GTO)<-c("1 lag","2 lags", "3 lags")
# GDP - GTO
GDP_GTO_v<-as.vector(GDP_GTO)
CV_GTO_v<-as.vector(CV_GTO)
GDP_GTO_v2<-cbind(GDP_GTO_v,CV_GTO_v)
colnames(GDP_GTO_v2)<-c("GDP_GTO","CV_GTO")
a<- lag(GDP_GTO_v,0)
x<- lag(GDP_GTO_v,1)
y<- lag(GDP_GTO_v,2)
z<- lag(GDP_GTO_v,3)
GDP_GTO_lags <- cbind(x,y,z)

fitGDP_GTO1 <- auto.arima(GDP_GTO_v2[4: 63,2], xreg=GDP_GTO_lags[4: 63,1], d=0)
fitGDP_GTO2 <- auto.arima(GDP_GTO_v2[4: 63,2], xreg=GDP_GTO_lags[4: 63,1:2], d=0)
fitGDP_GTO3 <- auto.arima(GDP_GTO_v2[4: 63,2], xreg=GDP_GTO_lags[4: 63,1:3], d=0)
AIC_GDP_GTO <- cbind(fitGDP_GTO1$aic,fitGDP_GTO2$aic,fitGDP_GTO3$aic)
colnames(AIC_GDP_GTO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - GTO
INPC_SUB_GTO_v<-as.vector(INPC_SUB_GTO)
CV_GTO_v<-as.vector(CV_GTO)
INPC_SUB_GTO_v2<-cbind(INPC_SUB_GTO_v,CV_GTO_v)
colnames(INPC_SUB_GTO_v2)<-c("INPC_SUB_GTO","CV_GTO")
a<- lag(INPC_SUB_GTO_v,0)
x<- lag(INPC_SUB_GTO_v,1)
y<- lag(INPC_SUB_GTO_v,2)
z<- lag(INPC_SUB_GTO_v,3)
INPC_SUB_GTO_lags <- cbind(x,y,z)
```

```
fitINPC_SUB_GTO1 <- auto.arima(INPC_SUB_GTO_v2[4: 63,2], xreg=INPC_SUB_GTO_lags[4: 63,1], d=0)
fitINPC_SUB_GTO2 <- auto.arima(INPC_SUB_GTO_v2[4: 63,2], xreg=INPC_SUB_GTO_lags[4: 63,1:2], d=0)
fitINPC_SUB_GTO3 <- auto.arima(INPC_SUB_GTO_v2[4: 63,2], xreg=INPC_SUB_GTO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_GTO <- cbind(fitINPC_SUB_GTO1$aic,fitINPC_SUB_GTO2$aic,fitINPC_SUB_GTO3$aic)
colnames(AIC_INPC_SUB_GTO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - GTO
INPC_E_GTO_v<-as.vector(INPC_E_GTO)
CV_GTO_v<-as.vector(CV_GTO)
INPC_E_GTO_v2<-cbind(INPC_E_GTO_v,CV_GTO_v)
colnames(INPC_E_GTO_v2)<-c("INPC_E_GTO","CV_GTO")
a<- lag(INPC_E_GTO_v,0)
x<- lag(INPC_E_GTO_v,1)
y<- lag(INPC_E_GTO_v,2)
z<- lag(INPC_E_GTO_v,3)
INPC_E_GTO_lags <- cbind(x,y,z)

fitINPC_E_GTO1 <- auto.arima(INPC_E_GTO_v2[4: 63,2], xreg=INPC_E_GTO_lags[4: 63,1], d=0)
fitINPC_E_GTO2 <- auto.arima(INPC_E_GTO_v2[4: 63,2], xreg=INPC_E_GTO_lags[4: 63,1:2], d=0)
fitINPC_E_GTO3 <- auto.arima(INPC_E_GTO_v2[4: 63,2], xreg=INPC_E_GTO_lags[4: 63,1:3], d=0)
AIC_INPC_E_GTO <- cbind(fitINPC_E_GTO1$aic,fitINPC_E_GTO2$aic,fitINPC_E_GTO3$aic)
colnames(AIC_INPC_E_GTO)<-c("1 lag","2 lags", "3 lags")
# M1 - GTO
M1_GTO_v<-as.vector(M1_GTO)
CV_GTO_v<-as.vector(CV_GTO)
M1_GTO_v2<-cbind(M1_GTO_v,CV_GTO_v)
colnames(M1_GTO_v2)<-c("M1_GTO","CV_GTO")
a<- lag(M1_GTO_v,0)
x<- lag(M1_GTO_v,1)
y<- lag(M1_GTO_v,2)
z<- lag(M1_GTO_v,3)
M1_GTO_lags <- cbind(x,y,z)

fitM1_GTO1 <- auto.arima(M1_GTO_v2[4: 63,2], xreg=M1_GTO_lags[4: 63,1], d=0)
fitM1_GTO2 <- auto.arima(M1_GTO_v2[4: 63,2], xreg=M1_GTO_lags[4: 63,1:2], d=0)
fitM1_GTO3 <- auto.arima(M1_GTO_v2[4: 63,2], xreg=M1_GTO_lags[4: 63,1:3], d=0)
AIC_M1_GTO <- cbind(fitM1_GTO1$aic,fitM1_GTO2$aic,fitM1_GTO3$aic)
colnames(AIC_M1_GTO)<-c("1 lag","2 lags", "3 lags")
# CONF - GTO
CONF_GTO_v<-as.vector(CONF_GTO)
CV_GTO_v<-as.vector(CV_GTO)
CONF_GTO_v2<-cbind(CONF_GTO_v,CV_GTO_v)
colnames(CONF_GTO_v2)<-c("CONF_GTO","CV_GTO")
a<- lag(CONF_GTO_v,0)
x<- lag(CONF_GTO_v,1)
y<- lag(CONF_GTO_v,2)
z<- lag(CONF_GTO_v,3)
CONF_GTO_lags <- cbind(x,y,z)

fitCONF_GTO1 <- auto.arima(CONF_GTO_v2[4: 63,2], xreg=CONF_GTO_lags[4: 63,1], d=0)
fitCONF_GTO2 <- auto.arima(CONF_GTO_v2[4: 63,2], xreg=CONF_GTO_lags[4: 63,1:2], d=0)
fitCONF_GTO3 <- auto.arima(CONF_GTO_v2[4: 63,2], xreg=CONF_GTO_lags[4: 63,1:3], d=0)
AIC_CONF_GTO <- cbind(fitCONF_GTO1$aic,fitCONF_GTO2$aic,fitCONF_GTO3$aic)
colnames(AIC_CONF_GTO)<-c("1 lag","2 lags", "3 lags")
```

```
AICs_GTO<-rbind(AIC_IPV_GTO,AIC_UNEMP_GTO,AIC_REM_GTO,AIC_GDP_GTO,AIC_INPC_SUB_GTO,AIC_INPC_E_GTO,AIC_M
rownames(AICs_GTO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_GTO
```

```
##              1 lag   2 lags   3 lags
## IPV       94.63149 96.55353 98.28584
## DESEMPLEO 93.86636 95.82713 97.78504
## REMESAS   93.83611 95.72767 97.54792
## PIB       94.74809 92.74009 94.01860
## INPC_SUB  94.16639 95.54986 94.75705
## INPC_E    92.49744 94.38981 96.11096
## M1        93.42666 94.04801 96.04787
## CONF      94.67014 96.65774 98.49975
```

```
# HGO
# IPV - HGO
IPV_HGO_v<-as.vector(IPV_HGO)
CV_HGO_v<-as.vector(CV_HGO)
IPV_HGO_v2<-cbind(IPV_HGO_v,CV_HGO_v)
colnames(IPV_HGO_v2)<-c("IPV_HGO","CV_HGO")
a<- lag(IPV_HGO_v,0)
x<- lag(IPV_HGO_v,1)
y<- lag(IPV_HGO_v,2)
z<- lag(IPV_HGO_v,3)
IPV_HGO_lags <- cbind(x,y,z)

fitIPV_HGO1 <- auto.arima(IPV_HGO_v2[4: 63,2], xreg=IPV_HGO_lags[4: 63,1], d=0)
fitIPV_HGO2 <- auto.arima(IPV_HGO_v2[4: 63,2], xreg=IPV_HGO_lags[4: 63,1:2], d=0)
fitIPV_HGO3 <- auto.arima(IPV_HGO_v2[4: 63,2], xreg=IPV_HGO_lags[4: 63,1:3], d=0)
AIC_IPV_HGO <- cbind(fitIPV_HGO1$aic,fitIPV_HGO2$aic,fitIPV_HGO3$aic)
colnames(AIC_IPV_HGO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - HGO
UNEMP_HGO_v<-as.vector(UNEMP_HGO)
CV_HGO_v<-as.vector(CV_HGO)
UNEMP_HGO_v2<-cbind(UNEMP_HGO_v,CV_HGO_v)
colnames(UNEMP_HGO_v2)<-c("UNEMP_HGO","CV_HGO")
a<- lag(UNEMP_HGO_v,0)
x<- lag(UNEMP_HGO_v,1)
y<- lag(UNEMP_HGO_v,2)
z<- lag(UNEMP_HGO_v,3)
UNEMP_HGO_lags <- cbind(x,y,z)

fitUNEMP_HGO1 <- auto.arima(UNEMP_HGO_v2[4: 63,2], xreg=UNEMP_HGO_lags[4: 63,1], d=0)
fitUNEMP_HGO2 <- auto.arima(UNEMP_HGO_v2[4: 63,2], xreg=UNEMP_HGO_lags[4: 63,1:2], d=0)
fitUNEMP_HGO3 <- auto.arima(UNEMP_HGO_v2[4: 63,2], xreg=UNEMP_HGO_lags[4: 63,1:3], d=0)
AIC_UNEMP_HGO <- cbind(fitUNEMP_HGO1$aic,fitUNEMP_HGO2$aic,fitUNEMP_HGO3$aic)
colnames(AIC_UNEMP_HGO)<-c("1 lag","2 lags", "3 lags")
# REM - HGO
REM_HGO_v<-as.vector(REM_HGO)
CV_HGO_v<-as.vector(CV_HGO)
REM_HGO_v2<-cbind(REM_HGO_v,CV_HGO_v)
colnames(REM_HGO_v2)<-c("REM_HGO","CV_HGO")
a<- lag(REM_HGO_v,0)
```

```
x<- lag(REM_HGO_v,1)
y<- lag(REM_HGO_v,2)
z<- lag(REM_HGO_v,3)
REM_HGO_lags <- cbind(x,y,z)

fitREM_HGO1 <- auto.arima(REM_HGO_v2[4: 63,2], xreg=REM_HGO_lags[4: 63,1], d=0)
fitREM_HGO2 <- auto.arima(REM_HGO_v2[4: 63,2], xreg=REM_HGO_lags[4: 63,1:2], d=0)
fitREM_HGO3 <- auto.arima(REM_HGO_v2[4: 63,2], xreg=REM_HGO_lags[4: 63,1:3], d=0)
AIC_REM_HGO <- cbind(fitREM_HGO1$aic,fitREM_HGO2$aic,fitREM_HGO3$aic)
colnames(AIC_REM_HGO)<-c("1 lag","2 lags", "3 lags")
# GDP - HGO
GDP_HGO_v<-as.vector(GDP_HGO)
CV_HGO_v<-as.vector(CV_HGO)
GDP_HGO_v2<-cbind(GDP_HGO_v,CV_HGO_v)
colnames(GDP_HGO_v2)<-c("GDP_HGO","CV_HGO")
a<- lag(GDP_HGO_v,0)
x<- lag(GDP_HGO_v,1)
y<- lag(GDP_HGO_v,2)
z<- lag(GDP_HGO_v,3)
GDP_HGO_lags <- cbind(x,y,z)

fitGDP_HGO1 <- auto.arima(GDP_HGO_v2[4: 63,2], xreg=GDP_HGO_lags[4: 63,1], d=0)
fitGDP_HGO2 <- auto.arima(GDP_HGO_v2[4: 63,2], xreg=GDP_HGO_lags[4: 63,1:2], d=0)
fitGDP_HGO3 <- auto.arima(GDP_HGO_v2[4: 63,2], xreg=GDP_HGO_lags[4: 63,1:3], d=0)
AIC_GDP_HGO <- cbind(fitGDP_HGO1$aic,fitGDP_HGO2$aic,fitGDP_HGO3$aic)
colnames(AIC_GDP_HGO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - HGO
INPC_SUB_HGO_v<-as.vector(INPC_SUB_HGO)
CV_HGO_v<-as.vector(CV_HGO)
INPC_SUB_HGO_v2<-cbind(INPC_SUB_HGO_v,CV_HGO_v)
colnames(INPC_SUB_HGO_v2)<-c("INPC_SUB_HGO","CV_HGO")
a<- lag(INPC_SUB_HGO_v,0)
x<- lag(INPC_SUB_HGO_v,1)
y<- lag(INPC_SUB_HGO_v,2)
z<- lag(INPC_SUB_HGO_v,3)
INPC_SUB_HGO_lags <- cbind(x,y,z)

fitINPC_SUB_HGO1 <- auto.arima(INPC_SUB_HGO_v2[4: 63,2], xreg=INPC_SUB_HGO_lags[4: 63,1], d=0)
fitINPC_SUB_HGO2 <- auto.arima(INPC_SUB_HGO_v2[4: 63,2], xreg=INPC_SUB_HGO_lags[4: 63,1:2], d=0)
fitINPC_SUB_HGO3 <- auto.arima(INPC_SUB_HGO_v2[4: 63,2], xreg=INPC_SUB_HGO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_HGO <- cbind(fitINPC_SUB_HGO1$aic,fitINPC_SUB_HGO2$aic,fitINPC_SUB_HGO3$aic)
colnames(AIC_INPC_SUB_HGO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - HGO
INPC_E_HGO_v<-as.vector(INPC_E_HGO)
CV_HGO_v<-as.vector(CV_HGO)
INPC_E_HGO_v2<-cbind(INPC_E_HGO_v,CV_HGO_v)
colnames(INPC_E_HGO_v2)<-c("INPC_E_HGO","CV_HGO")
a<- lag(INPC_E_HGO_v,0)
x<- lag(INPC_E_HGO_v,1)
y<- lag(INPC_E_HGO_v,2)
z<- lag(INPC_E_HGO_v,3)
INPC_E_HGO_lags <- cbind(x,y,z)
```

```
fitINPC_E_HGO1 <- auto.arima(INPC_E_HGO_v2[4: 63,2], xreg=INPC_E_HGO_lags[4: 63,1], d=0)
fitINPC_E_HGO2 <- auto.arima(INPC_E_HGO_v2[4: 63,2], xreg=INPC_E_HGO_lags[4: 63,1:2], d=0)
fitINPC_E_HGO3 <- auto.arima(INPC_E_HGO_v2[4: 63,2], xreg=INPC_E_HGO_lags[4: 63,1:3], d=0)
AIC_INPC_E_HGO <- cbind(fitINPC_E_HGO1$aic,fitINPC_E_HGO2$aic,fitINPC_E_HGO3$aic)
colnames(AIC_INPC_E_HGO)<-c("1 lag","2 lags", "3 lags")
# M1 - HGO
M1_HGO_v<-as.vector(M1_HGO)
CV_HGO_v<-as.vector(CV_HGO)
M1_HGO_v2<-cbind(M1_HGO_v,CV_HGO_v)
colnames(M1_HGO_v2)<-c("M1_HGO","CV_HGO")
a<- lag(M1_HGO_v,0)
x<- lag(M1_HGO_v,1)
y<- lag(M1_HGO_v,2)
z<- lag(M1_HGO_v,3)
M1_HGO_lags <- cbind(x,y,z)

fitM1_HGO1 <- auto.arima(M1_HGO_v2[4: 63,2], xreg=M1_HGO_lags[4: 63,1], d=0)
fitM1_HGO2 <- auto.arima(M1_HGO_v2[4: 63,2], xreg=M1_HGO_lags[4: 63,1:2], d=0)
fitM1_HGO3 <- auto.arima(M1_HGO_v2[4: 63,2], xreg=M1_HGO_lags[4: 63,1:3], d=0)
AIC_M1_HGO <- cbind(fitM1_HGO1$aic,fitM1_HGO2$aic,fitM1_HGO3$aic)
colnames(AIC_M1_HGO)<-c("1 lag","2 lags", "3 lags")
# CONF - HGO
CONF_HGO_v<-as.vector(CONF_HGO)
CV_HGO_v<-as.vector(CV_HGO)
CONF_HGO_v2<-cbind(CONF_HGO_v,CV_HGO_v)
colnames(CONF_HGO_v2)<-c("CONF_HGO","CV_HGO")
a<- lag(CONF_HGO_v,0)
x<- lag(CONF_HGO_v,1)
y<- lag(CONF_HGO_v,2)
z<- lag(CONF_HGO_v,3)
CONF_HGO_lags <- cbind(x,y,z)

fitCONF_HGO1 <- auto.arima(CONF_HGO_v2[4: 63,2], xreg=CONF_HGO_lags[4: 63,1], d=0)
fitCONF_HGO2 <- auto.arima(CONF_HGO_v2[4: 63,2], xreg=CONF_HGO_lags[4: 63,1:2], d=0)
fitCONF_HGO3 <- auto.arima(CONF_HGO_v2[4: 63,2], xreg=CONF_HGO_lags[4: 63,1:3], d=0)
AIC_CONF_HGO <- cbind(fitCONF_HGO1$aic,fitCONF_HGO2$aic,fitCONF_HGO3$aic)
colnames(AIC_CONF_HGO)<-c("1 lag","2 lags", "3 lags")

AICs_HGO<-rbind(AIC_IPV_HGO,AIC_UNEMP_HGO,AIC_REM_HGO,AIC_GDP_HGO,AIC_INPC_SUB_HGO,AIC_INPC_E_HGO,AIC_M
rownames(AICs_HGO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_HGO
```

```
##              1 lag   2 lags   3 lags
## IPV       137.0053 138.8502 139.1326
## DESEMPLEO 143.6512 145.2608 146.6642
## REMESAS   143.7523 140.4939 142.4934
## PIB       142.0782 143.9699 142.9329
## INPC_SUB  143.7271 144.7097 144.8096
## INPC_E    143.3065 143.6231 145.8639
## M1        143.2261 144.6019 144.9064
## CONF      142.2841 144.0802 146.0732
```

```
# JAL
# IPV - JAL
IPV_JAL_v<-as.vector(IPV_JAL)
CV_JAL_v<-as.vector(CV_JAL)
IPV_JAL_v2<-cbind(IPV_JAL_v,CV_JAL_v)
colnames(IPV_JAL_v2)<-c("IPV_JAL","CV_JAL")
a<- lag(IPV_JAL_v,0)
x<- lag(IPV_JAL_v,1)
y<- lag(IPV_JAL_v,2)
z<- lag(IPV_JAL_v,3)
IPV_JAL_lags <- cbind(x,y,z)

fitIPV_JAL1 <- auto.arima(IPV_JAL_v2[4: 63,2], xreg=IPV_JAL_lags[4: 63,1], d=0)
fitIPV_JAL2 <- auto.arima(IPV_JAL_v2[4: 63,2], xreg=IPV_JAL_lags[4: 63,1:2], d=0)
fitIPV_JAL3 <- auto.arima(IPV_JAL_v2[4: 63,2], xreg=IPV_JAL_lags[4: 63,1:3], d=0)
AIC_IPV_JAL <- cbind(fitIPV_JAL1$aic,fitIPV_JAL2$aic,fitIPV_JAL3$aic)
colnames(AIC_IPV_JAL)<-c("1 lag","2 lags", "3 lags")
# UNEMP - JAL
UNEMP_JAL_v<-as.vector(UNEMP_JAL)
CV_JAL_v<-as.vector(CV_JAL)
UNEMP_JAL_v2<-cbind(UNEMP_JAL_v,CV_JAL_v)
colnames(UNEMP_JAL_v2)<-c("UNEMP_JAL","CV_JAL")
a<- lag(UNEMP_JAL_v,0)
x<- lag(UNEMP_JAL_v,1)
y<- lag(UNEMP_JAL_v,2)
z<- lag(UNEMP_JAL_v,3)
UNEMP_JAL_lags <- cbind(x,y,z)

fitUNEMP_JAL1 <- auto.arima(UNEMP_JAL_v2[4: 63,2], xreg=UNEMP_JAL_lags[4: 63,1], d=0)
fitUNEMP_JAL2 <- auto.arima(UNEMP_JAL_v2[4: 63,2], xreg=UNEMP_JAL_lags[4: 63,1:2], d=0)
fitUNEMP_JAL3 <- auto.arima(UNEMP_JAL_v2[4: 63,2], xreg=UNEMP_JAL_lags[4: 63,1:3], d=0)
AIC_UNEMP_JAL <- cbind(fitUNEMP_JAL1$aic,fitUNEMP_JAL2$aic,fitUNEMP_JAL3$aic)
colnames(AIC_UNEMP_JAL)<-c("1 lag","2 lags", "3 lags")
# REM - JAL
REM_JAL_v<-as.vector(REM_JAL)
CV_JAL_v<-as.vector(CV_JAL)
REM_JAL_v2<-cbind(REM_JAL_v,CV_JAL_v)
colnames(REM_JAL_v2)<-c("REM_JAL","CV_JAL")
a<- lag(REM_JAL_v,0)
x<- lag(REM_JAL_v,1)
y<- lag(REM_JAL_v,2)
z<- lag(REM_JAL_v,3)
REM_JAL_lags <- cbind(x,y,z)

fitREM_JAL1 <- auto.arima(REM_JAL_v2[4: 63,2], xreg=REM_JAL_lags[4: 63,1], d=0)
fitREM_JAL2 <- auto.arima(REM_JAL_v2[4: 63,2], xreg=REM_JAL_lags[4: 63,1:2], d=0)
fitREM_JAL3 <- auto.arima(REM_JAL_v2[4: 63,2], xreg=REM_JAL_lags[4: 63,1:3], d=0)
AIC_REM_JAL <- cbind(fitREM_JAL1$aic,fitREM_JAL2$aic,fitREM_JAL3$aic)
colnames(AIC_REM_JAL)<-c("1 lag","2 lags", "3 lags")
# GDP - JAL
GDP_JAL_v<-as.vector(GDP_JAL)
CV_JAL_v<-as.vector(CV_JAL)
GDP_JAL_v2<-cbind(GDP_JAL_v,CV_JAL_v)
```

```
colnames(GDP_JAL_v2)<-c("GDP_JAL","CV_JAL")
a<- lag(GDP_JAL_v,0)
x<- lag(GDP_JAL_v,1)
y<- lag(GDP_JAL_v,2)
z<- lag(GDP_JAL_v,3)
GDP_JAL_lags <- cbind(x,y,z)

fitGDP_JAL1 <- auto.arima(GDP_JAL_v2[4: 63,2], xreg=GDP_JAL_lags[4: 63,1], d=0)
fitGDP_JAL2 <- auto.arima(GDP_JAL_v2[4: 63,2], xreg=GDP_JAL_lags[4: 63,1:2], d=0)
fitGDP_JAL3 <- auto.arima(GDP_JAL_v2[4: 63,2], xreg=GDP_JAL_lags[4: 63,1:3], d=0)
AIC_GDP_JAL <- cbind(fitGDP_JAL1$aic,fitGDP_JAL2$aic,fitGDP_JAL3$aic)
colnames(AIC_GDP_JAL)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - JAL
INPC_SUB_JAL_v<-as.vector(INPC_SUB_JAL)
CV_JAL_v<-as.vector(CV_JAL)
INPC_SUB_JAL_v2<-cbind(INPC_SUB_JAL_v,CV_JAL_v)
colnames(INPC_SUB_JAL_v2)<-c("INPC_SUB_JAL","CV_JAL")
a<- lag(INPC_SUB_JAL_v,0)
x<- lag(INPC_SUB_JAL_v,1)
y<- lag(INPC_SUB_JAL_v,2)
z<- lag(INPC_SUB_JAL_v,3)
INPC_SUB_JAL_lags <- cbind(x,y,z)

fitINPC_SUB_JAL1 <- auto.arima(INPC_SUB_JAL_v2[4: 63,2], xreg=INPC_SUB_JAL_lags[4: 63,1], d=0)
fitINPC_SUB_JAL2 <- auto.arima(INPC_SUB_JAL_v2[4: 63,2], xreg=INPC_SUB_JAL_lags[4: 63,1:2], d=0)
fitINPC_SUB_JAL3 <- auto.arima(INPC_SUB_JAL_v2[4: 63,2], xreg=INPC_SUB_JAL_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_JAL <- cbind(fitINPC_SUB_JAL1$aic,fitINPC_SUB_JAL2$aic,fitINPC_SUB_JAL3$aic)
colnames(AIC_INPC_SUB_JAL)<-c("1 lag","2 lags", "3 lags")
# INPC_E - JAL
INPC_E_JAL_v<-as.vector(INPC_E_JAL)
CV_JAL_v<-as.vector(CV_JAL)
INPC_E_JAL_v2<-cbind(INPC_E_JAL_v,CV_JAL_v)
colnames(INPC_E_JAL_v2)<-c("INPC_E_JAL","CV_JAL")
a<- lag(INPC_E_JAL_v,0)
x<- lag(INPC_E_JAL_v,1)
y<- lag(INPC_E_JAL_v,2)
z<- lag(INPC_E_JAL_v,3)
INPC_E_JAL_lags <- cbind(x,y,z)

fitINPC_E_JAL1 <- auto.arima(INPC_E_JAL_v2[4: 63,2], xreg=INPC_E_JAL_lags[4: 63,1], d=0)
fitINPC_E_JAL2 <- auto.arima(INPC_E_JAL_v2[4: 63,2], xreg=INPC_E_JAL_lags[4: 63,1:2], d=0)
fitINPC_E_JAL3 <- auto.arima(INPC_E_JAL_v2[4: 63,2], xreg=INPC_E_JAL_lags[4: 63,1:3], d=0)
AIC_INPC_E_JAL <- cbind(fitINPC_E_JAL1$aic,fitINPC_E_JAL2$aic,fitINPC_E_JAL3$aic)
colnames(AIC_INPC_E_JAL)<-c("1 lag","2 lags", "3 lags")
# M1 - JAL
M1_JAL_v<-as.vector(M1_JAL)
CV_JAL_v<-as.vector(CV_JAL)
M1_JAL_v2<-cbind(M1_JAL_v,CV_JAL_v)
colnames(M1_JAL_v2)<-c("M1_JAL","CV_JAL")
a<- lag(M1_JAL_v,0)
x<- lag(M1_JAL_v,1)
y<- lag(M1_JAL_v,2)
z<- lag(M1_JAL_v,3)
```

```
M1_JAL_lags <- cbind(x,y,z)

fitM1_JAL1 <- auto.arima(M1_JAL_v2[4: 63,2], xreg=M1_JAL_lags[4: 63,1], d=0)
fitM1_JAL2 <- auto.arima(M1_JAL_v2[4: 63,2], xreg=M1_JAL_lags[4: 63,1:2], d=0)
fitM1_JAL3 <- auto.arima(M1_JAL_v2[4: 63,2], xreg=M1_JAL_lags[4: 63,1:3], d=0)
AIC_M1_JAL <- cbind(fitM1_JAL1$aic,fitM1_JAL2$aic,fitM1_JAL3$aic)
colnames(AIC_M1_JAL)<-c("1 lag","2 lags", "3 lags")
# CONF - JAL
CONF_JAL_v<-as.vector(CONF_JAL)
CV_JAL_v<-as.vector(CV_JAL)
CONF_JAL_v2<-cbind(CONF_JAL_v,CV_JAL_v)
colnames(CONF_JAL_v2)<-c("CONF_JAL","CV_JAL")
a<- lag(CONF_JAL_v,0)
x<- lag(CONF_JAL_v,1)
y<- lag(CONF_JAL_v,2)
z<- lag(CONF_JAL_v,3)
CONF_JAL_lags <- cbind(x,y,z)

fitCONF_JAL1 <- auto.arima(CONF_JAL_v2[4: 63,2], xreg=CONF_JAL_lags[4: 63,1], d=0)
fitCONF_JAL2 <- auto.arima(CONF_JAL_v2[4: 63,2], xreg=CONF_JAL_lags[4: 63,1:2], d=0)
fitCONF_JAL3 <- auto.arima(CONF_JAL_v2[4: 63,2], xreg=CONF_JAL_lags[4: 63,1:3], d=0)
AIC_CONF_JAL <- cbind(fitCONF_JAL1$aic,fitCONF_JAL2$aic,fitCONF_JAL3$aic)
colnames(AIC_CONF_JAL)<-c("1 lag","2 lags", "3 lags")

AICs_JAL<-rbind(AIC_IPV_JAL,AIC_UNEMP_JAL,AIC_REM_JAL,AIC_GDP_JAL,AIC_INPC_SUB_JAL,AIC_INPC_E_JAL,AIC_M
rownames(AICs_JAL)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_JAL
```

```
##              1 lag   2 lags   3 lags
## IPV       129.6867 131.5749 133.5569
## DESEMPLEO 129.8554 131.8486 128.9809
## REMESAS   130.6789 132.2837 132.1604
## PIB       130.5651 132.5625 130.6078
## INPC_SUB  129.1335 129.7349 130.7913
## INPC_E    130.5329 130.9770 132.8810
## M1        130.6404 132.0358 133.2705
## CONF      130.7337 130.7494 132.6380
```

```
# MEX
# IPV - MEX
IPV_MEX_v<-as.vector(IPV_MEX)
CV_MEX_v<-as.vector(CV_MEX)
IPV_MEX_v2<-cbind(IPV_MEX_v,CV_MEX_v)
colnames(IPV_MEX_v2)<-c("IPV_MEX","CV_MEX")
a<- lag(IPV_MEX_v,0)
x<- lag(IPV_MEX_v,1)
y<- lag(IPV_MEX_v,2)
z<- lag(IPV_MEX_v,3)
IPV_MEX_lags <- cbind(x,y,z)

fitIPV_MEX1 <- auto.arima(IPV_MEX_v2[4: 63,2], xreg=IPV_MEX_lags[4: 63,1], d=0)
fitIPV_MEX2 <- auto.arima(IPV_MEX_v2[4: 63,2], xreg=IPV_MEX_lags[4: 63,1:2], d=0)
fitIPV_MEX3 <- auto.arima(IPV_MEX_v2[4: 63,2], xreg=IPV_MEX_lags[4: 63,1:3], d=0)
```

```
AIC_IPV_MEX <- cbind(fitIPV_MEX1$aic,fitIPV_MEX2$aic,fitIPV_MEX3$aic)
colnames(AIC_IPV_MEX)<-c("1 lag","2 lags", "3 lags")
# UNEMP - MEX
UNEMP_MEX_v<-as.vector(UNEMP_MEX)
CV_MEX_v<-as.vector(CV_MEX)
UNEMP_MEX_v2<-cbind(UNEMP_MEX_v,CV_MEX_v)
colnames(UNEMP_MEX_v2)<-c("UNEMP_MEX","CV_MEX")
a<- lag(UNEMP_MEX_v,0)
x<- lag(UNEMP_MEX_v,1)
y<- lag(UNEMP_MEX_v,2)
z<- lag(UNEMP_MEX_v,3)
UNEMP_MEX_lags <- cbind(x,y,z)

fitUNEMP_MEX1 <- auto.arima(UNEMP_MEX_v2[4: 63,2], xreg=UNEMP_MEX_lags[4: 63,1], d=0)
fitUNEMP_MEX2 <- auto.arima(UNEMP_MEX_v2[4: 63,2], xreg=UNEMP_MEX_lags[4: 63,1:2], d=0)
fitUNEMP_MEX3 <- auto.arima(UNEMP_MEX_v2[4: 63,2], xreg=UNEMP_MEX_lags[4: 63,1:3], d=0)
AIC_UNEMP_MEX <- cbind(fitUNEMP_MEX1$aic,fitUNEMP_MEX2$aic,fitUNEMP_MEX3$aic)
colnames(AIC_UNEMP_MEX)<-c("1 lag","2 lags", "3 lags")
# REM - MEX
REM_MEX_v<-as.vector(REM_MEX)
CV_MEX_v<-as.vector(CV_MEX)
REM_MEX_v2<-cbind(REM_MEX_v,CV_MEX_v)
colnames(REM_MEX_v2)<-c("REM_MEX","CV_MEX")
a<- lag(REM_MEX_v,0)
x<- lag(REM_MEX_v,1)
y<- lag(REM_MEX_v,2)
z<- lag(REM_MEX_v,3)
REM_MEX_lags <- cbind(x,y,z)

fitREM_MEX1 <- auto.arima(REM_MEX_v2[4: 63,2], xreg=REM_MEX_lags[4: 63,1], d=0)
fitREM_MEX2 <- auto.arima(REM_MEX_v2[4: 63,2], xreg=REM_MEX_lags[4: 63,1:2], d=0)
fitREM_MEX3 <- auto.arima(REM_MEX_v2[4: 63,2], xreg=REM_MEX_lags[4: 63,1:3], d=0)
AIC_REM_MEX <- cbind(fitREM_MEX1$aic,fitREM_MEX2$aic,fitREM_MEX3$aic)
colnames(AIC_REM_MEX)<-c("1 lag","2 lags", "3 lags")
# GDP - MEX
GDP_MEX_v<-as.vector(GDP_MEX)
CV_MEX_v<-as.vector(CV_MEX)
GDP_MEX_v2<-cbind(GDP_MEX_v,CV_MEX_v)
colnames(GDP_MEX_v2)<-c("GDP_MEX","CV_MEX")
a<- lag(GDP_MEX_v,0)
x<- lag(GDP_MEX_v,1)
y<- lag(GDP_MEX_v,2)
z<- lag(GDP_MEX_v,3)
GDP_MEX_lags <- cbind(x,y,z)

fitGDP_MEX1 <- auto.arima(GDP_MEX_v2[4: 63,2], xreg=GDP_MEX_lags[4: 63,1], d=0)
fitGDP_MEX2 <- auto.arima(GDP_MEX_v2[4: 63,2], xreg=GDP_MEX_lags[4: 63,1:2], d=0)
fitGDP_MEX3 <- auto.arima(GDP_MEX_v2[4: 63,2], xreg=GDP_MEX_lags[4: 63,1:3], d=0)
AIC_GDP_MEX <- cbind(fitGDP_MEX1$aic,fitGDP_MEX2$aic,fitGDP_MEX3$aic)
colnames(AIC_GDP_MEX)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - MEX
INPC_SUB_MEX_v<-as.vector(INPC_SUB_MEX)
CV_MEX_v<-as.vector(CV_MEX)
```

```
INPC_SUB_MEX_v2<-cbind(INPC_SUB_MEX_v,CV_MEX_v)
colnames(INPC_SUB_MEX_v2)<-c("INPC_SUB_MEX","CV_MEX")
a<- lag(INPC_SUB_MEX_v,0)
x<- lag(INPC_SUB_MEX_v,1)
y<- lag(INPC_SUB_MEX_v,2)
z<- lag(INPC_SUB_MEX_v,3)
INPC_SUB_MEX_lags <- cbind(x,y,z)

fitINPC_SUB_MEX1 <- auto.arima(INPC_SUB_MEX_v2[4: 63,2], xreg=INPC_SUB_MEX_lags[4: 63,1], d=0)
fitINPC_SUB_MEX2 <- auto.arima(INPC_SUB_MEX_v2[4: 63,2], xreg=INPC_SUB_MEX_lags[4: 63,1:2], d=0)
fitINPC_SUB_MEX3 <- auto.arima(INPC_SUB_MEX_v2[4: 63,2], xreg=INPC_SUB_MEX_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_MEX <- cbind(fitINPC_SUB_MEX1$aic,fitINPC_SUB_MEX2$aic,fitINPC_SUB_MEX3$aic)
colnames(AIC_INPC_SUB_MEX)<-c("1 lag","2 lags", "3 lags")
# INPC_E - MEX
INPC_E_MEX_v<-as.vector(INPC_E_MEX)
CV_MEX_v<-as.vector(CV_MEX)
INPC_E_MEX_v2<-cbind(INPC_E_MEX_v,CV_MEX_v)
colnames(INPC_E_MEX_v2)<-c("INPC_E_MEX","CV_MEX")
a<- lag(INPC_E_MEX_v,0)
x<- lag(INPC_E_MEX_v,1)
y<- lag(INPC_E_MEX_v,2)
z<- lag(INPC_E_MEX_v,3)
INPC_E_MEX_lags <- cbind(x,y,z)

fitINPC_E_MEX1 <- auto.arima(INPC_E_MEX_v2[4: 63,2], xreg=INPC_E_MEX_lags[4: 63,1], d=0)
fitINPC_E_MEX2 <- auto.arima(INPC_E_MEX_v2[4: 63,2], xreg=INPC_E_MEX_lags[4: 63,1:2], d=0)
fitINPC_E_MEX3 <- auto.arima(INPC_E_MEX_v2[4: 63,2], xreg=INPC_E_MEX_lags[4: 63,1:3], d=0)
AIC_INPC_E_MEX <- cbind(fitINPC_E_MEX1$aic,fitINPC_E_MEX2$aic,fitINPC_E_MEX3$aic)
colnames(AIC_INPC_E_MEX)<-c("1 lag","2 lags", "3 lags")
# M1 - MEX
M1_MEX_v<-as.vector(M1_MEX)
CV_MEX_v<-as.vector(CV_MEX)
M1_MEX_v2<-cbind(M1_MEX_v,CV_MEX_v)
colnames(M1_MEX_v2)<-c("M1_MEX","CV_MEX")
a<- lag(M1_MEX_v,0)
x<- lag(M1_MEX_v,1)
y<- lag(M1_MEX_v,2)
z<- lag(M1_MEX_v,3)
M1_MEX_lags <- cbind(x,y,z)

fitM1_MEX1 <- auto.arima(M1_MEX_v2[4: 63,2], xreg=M1_MEX_lags[4: 63,1], d=0)
fitM1_MEX2 <- auto.arima(M1_MEX_v2[4: 63,2], xreg=M1_MEX_lags[4: 63,1:2], d=0)
fitM1_MEX3 <- auto.arima(M1_MEX_v2[4: 63,2], xreg=M1_MEX_lags[4: 63,1:3], d=0)
AIC_M1_MEX <- cbind(fitM1_MEX1$aic,fitM1_MEX2$aic,fitM1_MEX3$aic)
colnames(AIC_M1_MEX)<-c("1 lag","2 lags", "3 lags")
# CONF - MEX
CONF_MEX_v<-as.vector(CONF_MEX)
CV_MEX_v<-as.vector(CV_MEX)
CONF_MEX_v2<-cbind(CONF_MEX_v,CV_MEX_v)
colnames(CONF_MEX_v2)<-c("CONF_MEX","CV_MEX")
a<- lag(CONF_MEX_v,0)
x<- lag(CONF_MEX_v,1)
y<- lag(CONF_MEX_v,2)
```

```
z<- lag(CONF_MEX_v,3)
CONF_MEX_lags <- cbind(x,y,z)

fitCONF_MEX1 <- auto.arima(CONF_MEX_v2[4: 63,2], xreg=CONF_MEX_lags[4: 63,1], d=0)
fitCONF_MEX2 <- auto.arima(CONF_MEX_v2[4: 63,2], xreg=CONF_MEX_lags[4: 63,1:2], d=0)
fitCONF_MEX3 <- auto.arima(CONF_MEX_v2[4: 63,2], xreg=CONF_MEX_lags[4: 63,1:3], d=0)
AIC_CONF_MEX <- cbind(fitCONF_MEX1$aic,fitCONF_MEX2$aic,fitCONF_MEX3$aic)
colnames(AIC_CONF_MEX)<-c("1 lag","2 lags", "3 lags")

AICs_MEX<-rbind(AIC_IPV_MEX,AIC_UNEMP_MEX,AIC_REM_MEX,AIC_GDP_MEX,AIC_INPC_SUB_MEX,AIC_INPC_E_MEX,AIC_M
rownames(AICs_MEX)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_MEX
```

```
##              1 lag   2 lags   3 lags
## IPV       47.23932 47.04762 47.71771
## DESEMPLEO 48.99107 50.49226 52.44530
## REMESAS   49.11571 49.08798 51.06593
## PIB       47.08143 40.49023 42.46943
## INPC_SUB  46.20004 45.74692 47.41675
## INPC_E    47.38619 48.33079 51.18419
## M1        47.10273 48.87513 50.10306
## CONF      46.77655 47.66121 48.44104
```

```
# MICH
# IPV - MICH
IPV_MICH_v<-as.vector(IPV_MICH)
CV_MICH_v<-as.vector(CV_MICH)
IPV_MICH_v2<-cbind(IPV_MICH_v,CV_MICH_v)
colnames(IPV_MICH_v2)<-c("IPV_MICH","CV_MICH")
a<- lag(IPV_MICH_v,0)
x<- lag(IPV_MICH_v,1)
y<- lag(IPV_MICH_v,2)
z<- lag(IPV_MICH_v,3)
IPV_MICH_lags <- cbind(x,y,z)

fitIPV_MICH1 <- auto.arima(IPV_MICH_v2[4: 63,2], xreg=IPV_MICH_lags[4: 63,1], d=0)
fitIPV_MICH2 <- auto.arima(IPV_MICH_v2[4: 63,2], xreg=IPV_MICH_lags[4: 63,1:2], d=0)
fitIPV_MICH3 <- auto.arima(IPV_MICH_v2[4: 63,2], xreg=IPV_MICH_lags[4: 63,1:3], d=0)
AIC_IPV_MICH <- cbind(fitIPV_MICH1$aic,fitIPV_MICH2$aic,fitIPV_MICH3$aic)
colnames(AIC_IPV_MICH)<-c("1 lag","2 lags", "3 lags")
# UNEMP - MICH
UNEMP_MICH_v<-as.vector(UNEMP_MICH)
CV_MICH_v<-as.vector(CV_MICH)
UNEMP_MICH_v2<-cbind(UNEMP_MICH_v,CV_MICH_v)
colnames(UNEMP_MICH_v2)<-c("UNEMP_MICH","CV_MICH")
a<- lag(UNEMP_MICH_v,0)
x<- lag(UNEMP_MICH_v,1)
y<- lag(UNEMP_MICH_v,2)
z<- lag(UNEMP_MICH_v,3)
UNEMP_MICH_lags <- cbind(x,y,z)

fitUNEMP_MICH1 <- auto.arima(UNEMP_MICH_v2[4: 63,2], xreg=UNEMP_MICH_lags[4: 63,1], d=0)
fitUNEMP_MICH2 <- auto.arima(UNEMP_MICH_v2[4: 63,2], xreg=UNEMP_MICH_lags[4: 63,1:2], d=0)
```

```
fitUNEMP_MICH3 <- auto.arima(UNEMP_MICH_v2[4: 63,2], xreg=UNEMP_MICH_lags[4: 63,1:3], d=0)
AIC_UNEMP_MICH <- cbind(fitUNEMP_MICH1$aic,fitUNEMP_MICH2$aic,fitUNEMP_MICH3$aic)
colnames(AIC_UNEMP_MICH)<-c("1 lag","2 lags", "3 lags")
# REM - MICH
REM_MICH_v<-as.vector(REM_MICH)
CV_MICH_v<-as.vector(CV_MICH)
REM_MICH_v2<-cbind(REM_MICH_v,CV_MICH_v)
colnames(REM_MICH_v2)<-c("REM_MICH","CV_MICH")
a<- lag(REM_MICH_v,0)
x<- lag(REM_MICH_v,1)
y<- lag(REM_MICH_v,2)
z<- lag(REM_MICH_v,3)
REM_MICH_lags <- cbind(x,y,z)

fitREM_MICH1 <- auto.arima(REM_MICH_v2[4: 63,2], xreg=REM_MICH_lags[4: 63,1], d=0)
fitREM_MICH2 <- auto.arima(REM_MICH_v2[4: 63,2], xreg=REM_MICH_lags[4: 63,1:2], d=0)
fitREM_MICH3 <- auto.arima(REM_MICH_v2[4: 63,2], xreg=REM_MICH_lags[4: 63,1:3], d=0)
AIC_REM_MICH <- cbind(fitREM_MICH1$aic,fitREM_MICH2$aic,fitREM_MICH3$aic)
colnames(AIC_REM_MICH)<-c("1 lag","2 lags", "3 lags")
# GDP - MICH
GDP_MICH_v<-as.vector(GDP_MICH)
CV_MICH_v<-as.vector(CV_MICH)
GDP_MICH_v2<-cbind(GDP_MICH_v,CV_MICH_v)
colnames(GDP_MICH_v2)<-c("GDP_MICH","CV_MICH")
a<- lag(GDP_MICH_v,0)
x<- lag(GDP_MICH_v,1)
y<- lag(GDP_MICH_v,2)
z<- lag(GDP_MICH_v,3)
GDP_MICH_lags <- cbind(x,y,z)

fitGDP_MICH1 <- auto.arima(GDP_MICH_v2[4: 63,2], xreg=GDP_MICH_lags[4: 63,1], d=0)
fitGDP_MICH2 <- auto.arima(GDP_MICH_v2[4: 63,2], xreg=GDP_MICH_lags[4: 63,1:2], d=0)
fitGDP_MICH3 <- auto.arima(GDP_MICH_v2[4: 63,2], xreg=GDP_MICH_lags[4: 63,1:3], d=0)
AIC_GDP_MICH <- cbind(fitGDP_MICH1$aic,fitGDP_MICH2$aic,fitGDP_MICH3$aic)
colnames(AIC_GDP_MICH)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - MICH
INPC_SUB_MICH_v<-as.vector(INPC_SUB_MICH)
CV_MICH_v<-as.vector(CV_MICH)
INPC_SUB_MICH_v2<-cbind(INPC_SUB_MICH_v,CV_MICH_v)
colnames(INPC_SUB_MICH_v2)<-c("INPC_SUB_MICH","CV_MICH")
a<- lag(INPC_SUB_MICH_v,0)
x<- lag(INPC_SUB_MICH_v,1)
y<- lag(INPC_SUB_MICH_v,2)
z<- lag(INPC_SUB_MICH_v,3)
INPC_SUB_MICH_lags <- cbind(x,y,z)

fitINPC_SUB_MICH1 <- auto.arima(INPC_SUB_MICH_v2[4: 63,2], xreg=INPC_SUB_MICH_lags[4: 63,1], d=0)
fitINPC_SUB_MICH2 <- auto.arima(INPC_SUB_MICH_v2[4: 63,2], xreg=INPC_SUB_MICH_lags[4: 63,1:2], d=0)
fitINPC_SUB_MICH3 <- auto.arima(INPC_SUB_MICH_v2[4: 63,2], xreg=INPC_SUB_MICH_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_MICH <- cbind(fitINPC_SUB_MICH1$aic,fitINPC_SUB_MICH2$aic,fitINPC_SUB_MICH3$aic)
colnames(AIC_INPC_SUB_MICH)<-c("1 lag","2 lags", "3 lags")
# INPC_E - MICH
INPC_E_MICH_v<-as.vector(INPC_E_MICH)
```

```
CV_MICH_v<-as.vector(CV_MICH)
INPC_E_MICH_v2<-cbind(INPC_E_MICH_v,CV_MICH_v)
colnames(INPC_E_MICH_v2)<-c("INPC_E_MICH","CV_MICH")
a<- lag(INPC_E_MICH_v,0)
x<- lag(INPC_E_MICH_v,1)
y<- lag(INPC_E_MICH_v,2)
z<- lag(INPC_E_MICH_v,3)
INPC_E_MICH_lags <- cbind(x,y,z)

fitINPC_E_MICH1 <- auto.arima(INPC_E_MICH_v2[4: 63,2], xreg=INPC_E_MICH_lags[4: 63,1], d=0)
fitINPC_E_MICH2 <- auto.arima(INPC_E_MICH_v2[4: 63,2], xreg=INPC_E_MICH_lags[4: 63,1:2], d=0)
fitINPC_E_MICH3 <- auto.arima(INPC_E_MICH_v2[4: 63,2], xreg=INPC_E_MICH_lags[4: 63,1:3], d=0)
AIC_INPC_E_MICH <- cbind(fitINPC_E_MICH1$aic,fitINPC_E_MICH2$aic,fitINPC_E_MICH3$aic)
colnames(AIC_INPC_E_MICH)<-c("1 lag","2 lags", "3 lags")
# M1 - MICH
M1_MICH_v<-as.vector(M1_MICH)
CV_MICH_v<-as.vector(CV_MICH)
M1_MICH_v2<-cbind(M1_MICH_v,CV_MICH_v)
colnames(M1_MICH_v2)<-c("M1_MICH","CV_MICH")
a<- lag(M1_MICH_v,0)
x<- lag(M1_MICH_v,1)
y<- lag(M1_MICH_v,2)
z<- lag(M1_MICH_v,3)
M1_MICH_lags <- cbind(x,y,z)

fitM1_MICH1 <- auto.arima(M1_MICH_v2[4: 63,2], xreg=M1_MICH_lags[4: 63,1], d=0)
fitM1_MICH2 <- auto.arima(M1_MICH_v2[4: 63,2], xreg=M1_MICH_lags[4: 63,1:2], d=0)
fitM1_MICH3 <- auto.arima(M1_MICH_v2[4: 63,2], xreg=M1_MICH_lags[4: 63,1:3], d=0)
AIC_M1_MICH <- cbind(fitM1_MICH1$aic,fitM1_MICH2$aic,fitM1_MICH3$aic)
colnames(AIC_M1_MICH)<-c("1 lag","2 lags", "3 lags")
# CONF - MICH
CONF_MICH_v<-as.vector(CONF_MICH)
CV_MICH_v<-as.vector(CV_MICH)
CONF_MICH_v2<-cbind(CONF_MICH_v,CV_MICH_v)
colnames(CONF_MICH_v2)<-c("CONF_MICH","CV_MICH")
a<- lag(CONF_MICH_v,0)
x<- lag(CONF_MICH_v,1)
y<- lag(CONF_MICH_v,2)
z<- lag(CONF_MICH_v,3)
CONF_MICH_lags <- cbind(x,y,z)

fitCONF_MICH1 <- auto.arima(CONF_MICH_v2[4: 63,2], xreg=CONF_MICH_lags[4: 63,1], d=0)
fitCONF_MICH2 <- auto.arima(CONF_MICH_v2[4: 63,2], xreg=CONF_MICH_lags[4: 63,1:2], d=0)
fitCONF_MICH3 <- auto.arima(CONF_MICH_v2[4: 63,2], xreg=CONF_MICH_lags[4: 63,1:3], d=0)
AIC_CONF_MICH <- cbind(fitCONF_MICH1$aic,fitCONF_MICH2$aic,fitCONF_MICH3$aic)
colnames(AIC_CONF_MICH)<-c("1 lag","2 lags", "3 lags")

AICs_MICH<-rbind(AIC_IPV_MICH,AIC_UNEMP_MICH,AIC_REM_MICH,AIC_GDP_MICH,AIC_INPC_SUB_MICH,AIC_INPC_E_MICH
rownames(AICs_MICH)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_MICH
```

```
##              1 lag   2 lags    3 lags
## IPV       96.79248 98.67675 100.65917
```

```
## DESEMPLEO 96.84384 97.71995  99.62825
## REMESAS   96.88563 98.17125 100.15707
## PIB       96.23767 98.00593  99.22733
## INPC_SUB  96.55205 97.24292  99.19314
## INPC_E    96.97157 98.94807 100.73145
## M1        97.34387 99.32547 100.90956
## CONF      97.36617 97.65049  99.54881
```

```
# MOR
# IPV - MOR
IPV_MOR_v<-as.vector(IPV_MOR)
CV_MOR_v<-as.vector(CV_MOR)
IPV_MOR_v2<-cbind(IPV_MOR_v,CV_MOR_v)
colnames(IPV_MOR_v2)<-c("IPV_MOR","CV_MOR")
a<- lag(IPV_MOR_v,0)
x<- lag(IPV_MOR_v,1)
y<- lag(IPV_MOR_v,2)
z<- lag(IPV_MOR_v,3)
IPV_MOR_lags <- cbind(x,y,z)

fitIPV_MOR1 <- auto.arima(IPV_MOR_v2[4: 63,2], xreg=IPV_MOR_lags[4: 63,1], d=0)
fitIPV_MOR2 <- auto.arima(IPV_MOR_v2[4: 63,2], xreg=IPV_MOR_lags[4: 63,1:2], d=0)
fitIPV_MOR3 <- auto.arima(IPV_MOR_v2[4: 63,2], xreg=IPV_MOR_lags[4: 63,1:3], d=0)
AIC_IPV_MOR <- cbind(fitIPV_MOR1$aic,fitIPV_MOR2$aic,fitIPV_MOR3$aic)
colnames(AIC_IPV_MOR)<-c("1 lag","2 lags", "3 lags")
# UNEMP - MOR
UNEMP_MOR_v<-as.vector(UNEMP_MOR)
CV_MOR_v<-as.vector(CV_MOR)
UNEMP_MOR_v2<-cbind(UNEMP_MOR_v,CV_MOR_v)
colnames(UNEMP_MOR_v2)<-c("UNEMP_MOR","CV_MOR")
a<- lag(UNEMP_MOR_v,0)
x<- lag(UNEMP_MOR_v,1)
y<- lag(UNEMP_MOR_v,2)
z<- lag(UNEMP_MOR_v,3)
UNEMP_MOR_lags <- cbind(x,y,z)

fitUNEMP_MOR1 <- auto.arima(UNEMP_MOR_v2[4: 63,2], xreg=UNEMP_MOR_lags[4: 63,1], d=0)
fitUNEMP_MOR2 <- auto.arima(UNEMP_MOR_v2[4: 63,2], xreg=UNEMP_MOR_lags[4: 63,1:2], d=0)
fitUNEMP_MOR3 <- auto.arima(UNEMP_MOR_v2[4: 63,2], xreg=UNEMP_MOR_lags[4: 63,1:3], d=0)
AIC_UNEMP_MOR <- cbind(fitUNEMP_MOR1$aic,fitUNEMP_MOR2$aic,fitUNEMP_MOR3$aic)
colnames(AIC_UNEMP_MOR)<-c("1 lag","2 lags", "3 lags")
# REM - MOR
REM_MOR_v<-as.vector(REM_MOR)
CV_MOR_v<-as.vector(CV_MOR)
REM_MOR_v2<-cbind(REM_MOR_v,CV_MOR_v)
colnames(REM_MOR_v2)<-c("REM_MOR","CV_MOR")
a<- lag(REM_MOR_v,0)
x<- lag(REM_MOR_v,1)
y<- lag(REM_MOR_v,2)
z<- lag(REM_MOR_v,3)
REM_MOR_lags <- cbind(x,y,z)

fitREM_MOR1 <- auto.arima(REM_MOR_v2[4: 63,2], xreg=REM_MOR_lags[4: 63,1], d=0)
fitREM_MOR2 <- auto.arima(REM_MOR_v2[4: 63,2], xreg=REM_MOR_lags[4: 63,1:2], d=0)
```

```
fitREM_MOR3 <- auto.arima(REM_MOR_v2[4: 63,2], xreg=REM_MOR_lags[4: 63,1:3], d=0)
AIC_REM_MOR <- cbind(fitREM_MOR1$aic,fitREM_MOR2$aic,fitREM_MOR3$aic)
colnames(AIC_REM_MOR)<-c("1 lag","2 lags", "3 lags")
# GDP - MOR
GDP_MOR_v<-as.vector(GDP_MOR)
CV_MOR_v<-as.vector(CV_MOR)
GDP_MOR_v2<-cbind(GDP_MOR_v,CV_MOR_v)
colnames(GDP_MOR_v2)<-c("GDP_MOR","CV_MOR")
a<- lag(GDP_MOR_v,0)
x<- lag(GDP_MOR_v,1)
y<- lag(GDP_MOR_v,2)
z<- lag(GDP_MOR_v,3)
GDP_MOR_lags <- cbind(x,y,z)

fitGDP_MOR1 <- auto.arima(GDP_MOR_v2[4: 63,2], xreg=GDP_MOR_lags[4: 63,1], d=0)
fitGDP_MOR2 <- auto.arima(GDP_MOR_v2[4: 63,2], xreg=GDP_MOR_lags[4: 63,1:2], d=0)
fitGDP_MOR3 <- auto.arima(GDP_MOR_v2[4: 63,2], xreg=GDP_MOR_lags[4: 63,1:3], d=0)
AIC_GDP_MOR <- cbind(fitGDP_MOR1$aic,fitGDP_MOR2$aic,fitGDP_MOR3$aic)
colnames(AIC_GDP_MOR)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - MOR
INPC_SUB_MOR_v<-as.vector(INPC_SUB_MOR)
CV_MOR_v<-as.vector(CV_MOR)
INPC_SUB_MOR_v2<-cbind(INPC_SUB_MOR_v,CV_MOR_v)
colnames(INPC_SUB_MOR_v2)<-c("INPC_SUB_MOR","CV_MOR")
a<- lag(INPC_SUB_MOR_v,0)
x<- lag(INPC_SUB_MOR_v,1)
y<- lag(INPC_SUB_MOR_v,2)
z<- lag(INPC_SUB_MOR_v,3)
INPC_SUB_MOR_lags <- cbind(x,y,z)

fitINPC_SUB_MOR1 <- auto.arima(INPC_SUB_MOR_v2[4: 63,2], xreg=INPC_SUB_MOR_lags[4: 63,1], d=0)
fitINPC_SUB_MOR2 <- auto.arima(INPC_SUB_MOR_v2[4: 63,2], xreg=INPC_SUB_MOR_lags[4: 63,1:2], d=0)
fitINPC_SUB_MOR3 <- auto.arima(INPC_SUB_MOR_v2[4: 63,2], xreg=INPC_SUB_MOR_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_MOR <- cbind(fitINPC_SUB_MOR1$aic,fitINPC_SUB_MOR2$aic,fitINPC_SUB_MOR3$aic)
colnames(AIC_INPC_SUB_MOR)<-c("1 lag","2 lags", "3 lags")
# INPC_E - MOR
INPC_E_MOR_v<-as.vector(INPC_E_MOR)
CV_MOR_v<-as.vector(CV_MOR)
INPC_E_MOR_v2<-cbind(INPC_E_MOR_v,CV_MOR_v)
colnames(INPC_E_MOR_v2)<-c("INPC_E_MOR","CV_MOR")
a<- lag(INPC_E_MOR_v,0)
x<- lag(INPC_E_MOR_v,1)
y<- lag(INPC_E_MOR_v,2)
z<- lag(INPC_E_MOR_v,3)
INPC_E_MOR_lags <- cbind(x,y,z)

fitINPC_E_MOR1 <- auto.arima(INPC_E_MOR_v2[4: 63,2], xreg=INPC_E_MOR_lags[4: 63,1], d=0)
fitINPC_E_MOR2 <- auto.arima(INPC_E_MOR_v2[4: 63,2], xreg=INPC_E_MOR_lags[4: 63,1:2], d=0)
fitINPC_E_MOR3 <- auto.arima(INPC_E_MOR_v2[4: 63,2], xreg=INPC_E_MOR_lags[4: 63,1:3], d=0)
AIC_INPC_E_MOR <- cbind(fitINPC_E_MOR1$aic,fitINPC_E_MOR2$aic,fitINPC_E_MOR3$aic)
colnames(AIC_INPC_E_MOR)<-c("1 lag","2 lags", "3 lags")
# M1 - MOR
M1_MOR_v<-as.vector(M1_MOR)
```

```
CV_MOR_v<-as.vector(CV_MOR)
M1_MOR_v2<-cbind(M1_MOR_v,CV_MOR_v)
colnames(M1_MOR_v2)<-c("M1_MOR","CV_MOR")
a<- lag(M1_MOR_v,0)
x<- lag(M1_MOR_v,1)
y<- lag(M1_MOR_v,2)
z<- lag(M1_MOR_v,3)
M1_MOR_lags <- cbind(x,y,z)

fitM1_MOR1 <- auto.arima(M1_MOR_v2[4: 63,2], xreg=M1_MOR_lags[4: 63,1], d=0)
fitM1_MOR2 <- auto.arima(M1_MOR_v2[4: 63,2], xreg=M1_MOR_lags[4: 63,1:2], d=0)
fitM1_MOR3 <- auto.arima(M1_MOR_v2[4: 63,2], xreg=M1_MOR_lags[4: 63,1:3], d=0)
AIC_M1_MOR <- cbind(fitM1_MOR1$aic,fitM1_MOR2$aic,fitM1_MOR3$aic)
colnames(AIC_M1_MOR)<-c("1 lag","2 lags", "3 lags")
# CONF - MOR
CONF_MOR_v<-as.vector(CONF_MOR)
CV_MOR_v<-as.vector(CV_MOR)
CONF_MOR_v2<-cbind(CONF_MOR_v,CV_MOR_v)
colnames(CONF_MOR_v2)<-c("CONF_MOR","CV_MOR")
a<- lag(CONF_MOR_v,0)
x<- lag(CONF_MOR_v,1)
y<- lag(CONF_MOR_v,2)
z<- lag(CONF_MOR_v,3)
CONF_MOR_lags <- cbind(x,y,z)

fitCONF_MOR1 <- auto.arima(CONF_MOR_v2[4: 63,2], xreg=CONF_MOR_lags[4: 63,1], d=0)
fitCONF_MOR2 <- auto.arima(CONF_MOR_v2[4: 63,2], xreg=CONF_MOR_lags[4: 63,1:2], d=0)
fitCONF_MOR3 <- auto.arima(CONF_MOR_v2[4: 63,2], xreg=CONF_MOR_lags[4: 63,1:3], d=0)
AIC_CONF_MOR <- cbind(fitCONF_MOR1$aic,fitCONF_MOR2$aic,fitCONF_MOR3$aic)
colnames(AIC_CONF_MOR)<-c("1 lag","2 lags", "3 lags")

AICs_MOR<-rbind(AIC_IPV_MOR,AIC_UNEMP_MOR,AIC_REM_MOR,AIC_GDP_MOR,AIC_INPC_SUB_MOR,AIC_INPC_E_MOR,AIC_M
rownames(AICs_MOR)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_MOR
```

```
##              1 lag   2 lags   3 lags
## IPV       188.0383 188.7612 188.5544
## DESEMPLEO 187.3188 188.7876 190.7432
## REMESAS   187.7762 188.5588 190.5040
## PIB       187.9297 189.5439 191.5347
## INPC_SUB  186.5614 187.9016 188.0649
## INPC_E    186.8574 187.5340 189.4920
## M1        187.8198 187.6951 188.2427
## CONF      187.5446 187.7435 189.5355
```

```
# NAY
# IPV - NAY
IPV_NAY_v<-as.vector(IPV_NAY)
CV_NAY_v<-as.vector(CV_NAY)
IPV_NAY_v2<-cbind(IPV_NAY_v,CV_NAY_v)
colnames(IPV_NAY_v2)<-c("IPV_NAY","CV_NAY")
a<- lag(IPV_NAY_v,0)
x<- lag(IPV_NAY_v,1)
```

```
y<- lag(IPV_NAY_v,2)
z<- lag(IPV_NAY_v,3)
IPV_NAY_lags <- cbind(x,y,z)

fitIPV_NAY1 <- auto.arima(IPV_NAY_v2[4: 63,2], xreg=IPV_NAY_lags[4: 63,1], d=0)
fitIPV_NAY2 <- auto.arima(IPV_NAY_v2[4: 63,2], xreg=IPV_NAY_lags[4: 63,1:2], d=0)
fitIPV_NAY3 <- auto.arima(IPV_NAY_v2[4: 63,2], xreg=IPV_NAY_lags[4: 63,1:3], d=0)
AIC_IPV_NAY <- cbind(fitIPV_NAY1$aic,fitIPV_NAY2$aic,fitIPV_NAY3$aic)
colnames(AIC_IPV_NAY)<-c("1 lag","2 lags", "3 lags")
# UNEMP - NAY
UNEMP_NAY_v<-as.vector(UNEMP_NAY)
CV_NAY_v<-as.vector(CV_NAY)
UNEMP_NAY_v2<-cbind(UNEMP_NAY_v,CV_NAY_v)
colnames(UNEMP_NAY_v2)<-c("UNEMP_NAY","CV_NAY")
a<- lag(UNEMP_NAY_v,0)
x<- lag(UNEMP_NAY_v,1)
y<- lag(UNEMP_NAY_v,2)
z<- lag(UNEMP_NAY_v,3)
UNEMP_NAY_lags <- cbind(x,y,z)

fitUNEMP_NAY1 <- auto.arima(UNEMP_NAY_v2[4: 63,2], xreg=UNEMP_NAY_lags[4: 63,1], d=0)
fitUNEMP_NAY2 <- auto.arima(UNEMP_NAY_v2[4: 63,2], xreg=UNEMP_NAY_lags[4: 63,1:2], d=0)
fitUNEMP_NAY3 <- auto.arima(UNEMP_NAY_v2[4: 63,2], xreg=UNEMP_NAY_lags[4: 63,1:3], d=0)
AIC_UNEMP_NAY <- cbind(fitUNEMP_NAY1$aic,fitUNEMP_NAY2$aic,fitUNEMP_NAY3$aic)
colnames(AIC_UNEMP_NAY)<-c("1 lag","2 lags", "3 lags")
# REM - NAY
REM_NAY_v<-as.vector(REM_NAY)
CV_NAY_v<-as.vector(CV_NAY)
REM_NAY_v2<-cbind(REM_NAY_v,CV_NAY_v)
colnames(REM_NAY_v2)<-c("REM_NAY","CV_NAY")
a<- lag(REM_NAY_v,0)
x<- lag(REM_NAY_v,1)
y<- lag(REM_NAY_v,2)
z<- lag(REM_NAY_v,3)
REM_NAY_lags <- cbind(x,y,z)

fitREM_NAY1 <- auto.arima(REM_NAY_v2[4: 63,2], xreg=REM_NAY_lags[4: 63,1], d=0)
fitREM_NAY2 <- auto.arima(REM_NAY_v2[4: 63,2], xreg=REM_NAY_lags[4: 63,1:2], d=0)
fitREM_NAY3 <- auto.arima(REM_NAY_v2[4: 63,2], xreg=REM_NAY_lags[4: 63,1:3], d=0)
AIC_REM_NAY <- cbind(fitREM_NAY1$aic,fitREM_NAY2$aic,fitREM_NAY3$aic)
colnames(AIC_REM_NAY)<-c("1 lag","2 lags", "3 lags")
# GDP - NAY
GDP_NAY_v<-as.vector(GDP_NAY)
CV_NAY_v<-as.vector(CV_NAY)
GDP_NAY_v2<-cbind(GDP_NAY_v,CV_NAY_v)
colnames(GDP_NAY_v2)<-c("GDP_NAY","CV_NAY")
a<- lag(GDP_NAY_v,0)
x<- lag(GDP_NAY_v,1)
y<- lag(GDP_NAY_v,2)
z<- lag(GDP_NAY_v,3)
GDP_NAY_lags <- cbind(x,y,z)

fitGDP_NAY1 <- auto.arima(GDP_NAY_v2[4: 63,2], xreg=GDP_NAY_lags[4: 63,1], d=0)
```

```
fitGDP_NAY2 <- auto.arima(GDP_NAY_v2[4: 63,2], xreg=GDP_NAY_lags[4: 63,1:2], d=0)
fitGDP_NAY3 <- auto.arima(GDP_NAY_v2[4: 63,2], xreg=GDP_NAY_lags[4: 63,1:3], d=0)
AIC_GDP_NAY <- cbind(fitGDP_NAY1$aic,fitGDP_NAY2$aic,fitGDP_NAY3$aic)
colnames(AIC_GDP_NAY)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - NAY
INPC_SUB_NAY_v<-as.vector(INPC_SUB_NAY)
CV_NAY_v<-as.vector(CV_NAY)
INPC_SUB_NAY_v2<-cbind(INPC_SUB_NAY_v,CV_NAY_v)
colnames(INPC_SUB_NAY_v2)<-c("INPC_SUB_NAY","CV_NAY")
a<- lag(INPC_SUB_NAY_v,0)
x<- lag(INPC_SUB_NAY_v,1)
y<- lag(INPC_SUB_NAY_v,2)
z<- lag(INPC_SUB_NAY_v,3)
INPC_SUB_NAY_lags <- cbind(x,y,z)

fitINPC_SUB_NAY1 <- auto.arima(INPC_SUB_NAY_v2[4: 63,2], xreg=INPC_SUB_NAY_lags[4: 63,1], d=0)
fitINPC_SUB_NAY2 <- auto.arima(INPC_SUB_NAY_v2[4: 63,2], xreg=INPC_SUB_NAY_lags[4: 63,1:2], d=0)
fitINPC_SUB_NAY3 <- auto.arima(INPC_SUB_NAY_v2[4: 63,2], xreg=INPC_SUB_NAY_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_NAY <- cbind(fitINPC_SUB_NAY1$aic,fitINPC_SUB_NAY2$aic,fitINPC_SUB_NAY3$aic)
colnames(AIC_INPC_SUB_NAY)<-c("1 lag","2 lags", "3 lags")
# INPC_E - NAY
INPC_E_NAY_v<-as.vector(INPC_E_NAY)
CV_NAY_v<-as.vector(CV_NAY)
INPC_E_NAY_v2<-cbind(INPC_E_NAY_v,CV_NAY_v)
colnames(INPC_E_NAY_v2)<-c("INPC_E_NAY","CV_NAY")
a<- lag(INPC_E_NAY_v,0)
x<- lag(INPC_E_NAY_v,1)
y<- lag(INPC_E_NAY_v,2)
z<- lag(INPC_E_NAY_v,3)
INPC_E_NAY_lags <- cbind(x,y,z)

fitINPC_E_NAY1 <- auto.arima(INPC_E_NAY_v2[4: 63,2], xreg=INPC_E_NAY_lags[4: 63,1], d=0)
fitINPC_E_NAY2 <- auto.arima(INPC_E_NAY_v2[4: 63,2], xreg=INPC_E_NAY_lags[4: 63,1:2], d=0)
fitINPC_E_NAY3 <- auto.arima(INPC_E_NAY_v2[4: 63,2], xreg=INPC_E_NAY_lags[4: 63,1:3], d=0)
AIC_INPC_E_NAY <- cbind(fitINPC_E_NAY1$aic,fitINPC_E_NAY2$aic,fitINPC_E_NAY3$aic)
colnames(AIC_INPC_E_NAY)<-c("1 lag","2 lags", "3 lags")
# M1 - NAY
M1_NAY_v<-as.vector(M1_NAY)
CV_NAY_v<-as.vector(CV_NAY)
M1_NAY_v2<-cbind(M1_NAY_v,CV_NAY_v)
colnames(M1_NAY_v2)<-c("M1_NAY","CV_NAY")
a<- lag(M1_NAY_v,0)
x<- lag(M1_NAY_v,1)
y<- lag(M1_NAY_v,2)
z<- lag(M1_NAY_v,3)
M1_NAY_lags <- cbind(x,y,z)

fitM1_NAY1 <- auto.arima(M1_NAY_v2[4: 63,2], xreg=M1_NAY_lags[4: 63,1], d=0)
fitM1_NAY2 <- auto.arima(M1_NAY_v2[4: 63,2], xreg=M1_NAY_lags[4: 63,1:2], d=0)
fitM1_NAY3 <- auto.arima(M1_NAY_v2[4: 63,2], xreg=M1_NAY_lags[4: 63,1:3], d=0)
AIC_M1_NAY <- cbind(fitM1_NAY1$aic,fitM1_NAY2$aic,fitM1_NAY3$aic)
colnames(AIC_M1_NAY)<-c("1 lag","2 lags", "3 lags")
# CONF - NAY
```

```
CONF_NAY_v<-as.vector(CONF_NAY)
CV_NAY_v<-as.vector(CV_NAY)
CONF_NAY_v2<-cbind(CONF_NAY_v,CV_NAY_v)
colnames(CONF_NAY_v2)<-c("CONF_NAY","CV_NAY")
a<- lag(CONF_NAY_v,0)
x<- lag(CONF_NAY_v,1)
y<- lag(CONF_NAY_v,2)
z<- lag(CONF_NAY_v,3)
CONF_NAY_lags <- cbind(x,y,z)

fitCONF_NAY1 <- auto.arima(CONF_NAY_v2[4: 63,2], xreg=CONF_NAY_lags[4: 63,1], d=0)
fitCONF_NAY2 <- auto.arima(CONF_NAY_v2[4: 63,2], xreg=CONF_NAY_lags[4: 63,1:2], d=0)
fitCONF_NAY3 <- auto.arima(CONF_NAY_v2[4: 63,2], xreg=CONF_NAY_lags[4: 63,1:3], d=0)
AIC_CONF_NAY <- cbind(fitCONF_NAY1$aic,fitCONF_NAY2$aic,fitCONF_NAY3$aic)
colnames(AIC_CONF_NAY)<-c("1 lag","2 lags", "3 lags")

AICs_NAY<-rbind(AIC_IPV_NAY,AIC_UNEMP_NAY,AIC_REM_NAY,AIC_GDP_NAY,AIC_INPC_SUB_NAY,AIC_INPC_E_NAY,AIC_M
rownames(AICs_NAY)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_NAY
```

```
##              1 lag   2 lags   3 lags
## IPV       63.28665 62.96491 63.63371
## DESEMPLEO 64.59543 64.51509 65.78460
## REMESAS   64.56819 66.56094 67.77950
## PIB       64.33991 65.85101 64.91641
## INPC_SUB  63.40552 63.63309 65.61938
## INPC_E    64.50284 65.67561 67.58835
## M1        63.66083 65.23692 66.76453
## CONF      64.40376 65.52641 67.45852
```

```
# NL
# IPV - NL
IPV_NL_v<-as.vector(IPV_NL)
CV_NL_v<-as.vector(CV_NL)
IPV_NL_v2<-cbind(IPV_NL_v,CV_NL_v)
colnames(IPV_NL_v2)<-c("IPV_NL","CV_NL")
a<- lag(IPV_NL_v,0)
x<- lag(IPV_NL_v,1)
y<- lag(IPV_NL_v,2)
z<- lag(IPV_NL_v,3)
IPV_NL_lags <- cbind(x,y,z)

fitIPV_NL1 <- auto.arima(IPV_NL_v2[4: 63,2], xreg=IPV_NL_lags[4: 63,1], d=0)
fitIPV_NL2 <- auto.arima(IPV_NL_v2[4: 63,2], xreg=IPV_NL_lags[4: 63,1:2], d=0)
fitIPV_NL3 <- auto.arima(IPV_NL_v2[4: 63,2], xreg=IPV_NL_lags[4: 63,1:3], d=0)
AIC_IPV_NL <- cbind(fitIPV_NL1$aic,fitIPV_NL2$aic,fitIPV_NL3$aic)
colnames(AIC_IPV_NL)<-c("1 lag","2 lags", "3 lags")
# UNEMP - NL
UNEMP_NL_v<-as.vector(UNEMP_NL)
CV_NL_v<-as.vector(CV_NL)
UNEMP_NL_v2<-cbind(UNEMP_NL_v,CV_NL_v)
colnames(UNEMP_NL_v2)<-c("UNEMP_NL","CV_NL")
a<- lag(UNEMP_NL_v,0)
```

```
x<- lag(UNEMP_NL_v,1)
y<- lag(UNEMP_NL_v,2)
z<- lag(UNEMP_NL_v,3)
UNEMP_NL_lags <- cbind(x,y,z)

fitUNEMP_NL1 <- auto.arima(UNEMP_NL_v2[4: 63,2], xreg=UNEMP_NL_lags[4: 63,1], d=0)
fitUNEMP_NL2 <- auto.arima(UNEMP_NL_v2[4: 63,2], xreg=UNEMP_NL_lags[4: 63,1:2], d=0)
fitUNEMP_NL3 <- auto.arima(UNEMP_NL_v2[4: 63,2], xreg=UNEMP_NL_lags[4: 63,1:3], d=0)
AIC_UNEMP_NL <- cbind(fitUNEMP_NL1$aic,fitUNEMP_NL2$aic,fitUNEMP_NL3$aic)
colnames(AIC_UNEMP_NL)<-c("1 lag","2 lags", "3 lags")
# REM - NL
REM_NL_v<-as.vector(REM_NL)
CV_NL_v<-as.vector(CV_NL)
REM_NL_v2<-cbind(REM_NL_v,CV_NL_v)
colnames(REM_NL_v2)<-c("REM_NL","CV_NL")
a<- lag(REM_NL_v,0)
x<- lag(REM_NL_v,1)
y<- lag(REM_NL_v,2)
z<- lag(REM_NL_v,3)
REM_NL_lags <- cbind(x,y,z)

fitREM_NL1 <- auto.arima(REM_NL_v2[4: 63,2], xreg=REM_NL_lags[4: 63,1], d=0)
fitREM_NL2 <- auto.arima(REM_NL_v2[4: 63,2], xreg=REM_NL_lags[4: 63,1:2], d=0)
fitREM_NL3 <- auto.arima(REM_NL_v2[4: 63,2], xreg=REM_NL_lags[4: 63,1:3], d=0)
AIC_REM_NL <- cbind(fitREM_NL1$aic,fitREM_NL2$aic,fitREM_NL3$aic)
colnames(AIC_REM_NL)<-c("1 lag","2 lags", "3 lags")
# GDP - NL
GDP_NL_v<-as.vector(GDP_NL)
CV_NL_v<-as.vector(CV_NL)
GDP_NL_v2<-cbind(GDP_NL_v,CV_NL_v)
colnames(GDP_NL_v2)<-c("GDP_NL","CV_NL")
a<- lag(GDP_NL_v,0)
x<- lag(GDP_NL_v,1)
y<- lag(GDP_NL_v,2)
z<- lag(GDP_NL_v,3)
GDP_NL_lags <- cbind(x,y,z)

fitGDP_NL1 <- auto.arima(GDP_NL_v2[4: 63,2], xreg=GDP_NL_lags[4: 63,1], d=0)
fitGDP_NL2 <- auto.arima(GDP_NL_v2[4: 63,2], xreg=GDP_NL_lags[4: 63,1:2], d=0)
fitGDP_NL3 <- auto.arima(GDP_NL_v2[4: 63,2], xreg=GDP_NL_lags[4: 63,1:3], d=0)
AIC_GDP_NL <- cbind(fitGDP_NL1$aic,fitGDP_NL2$aic,fitGDP_NL3$aic)
colnames(AIC_GDP_NL)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - NL
INPC_SUB_NL_v<-as.vector(INPC_SUB_NL)
CV_NL_v<-as.vector(CV_NL)
INPC_SUB_NL_v2<-cbind(INPC_SUB_NL_v,CV_NL_v)
colnames(INPC_SUB_NL_v2)<-c("INPC_SUB_NL","CV_NL")
a<- lag(INPC_SUB_NL_v,0)
x<- lag(INPC_SUB_NL_v,1)
y<- lag(INPC_SUB_NL_v,2)
z<- lag(INPC_SUB_NL_v,3)
INPC_SUB_NL_lags <- cbind(x,y,z)
```

```
fitINPC_SUB_NL1 <- auto.arima(INPC_SUB_NL_v2[4: 63,2], xreg=INPC_SUB_NL_lags[4: 63,1], d=0)
fitINPC_SUB_NL2 <- auto.arima(INPC_SUB_NL_v2[4: 63,2], xreg=INPC_SUB_NL_lags[4: 63,1:2], d=0)
fitINPC_SUB_NL3 <- auto.arima(INPC_SUB_NL_v2[4: 63,2], xreg=INPC_SUB_NL_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_NL <- cbind(fitINPC_SUB_NL1$aic,fitINPC_SUB_NL2$aic,fitINPC_SUB_NL3$aic)
colnames(AIC_INPC_SUB_NL)<-c("1 lag","2 lags", "3 lags")
# INPC_E - NL
INPC_E_NL_v<-as.vector(INPC_E_NL)
CV_NL_v<-as.vector(CV_NL)
INPC_E_NL_v2<-cbind(INPC_E_NL_v,CV_NL_v)
colnames(INPC_E_NL_v2)<-c("INPC_E_NL","CV_NL")
a<- lag(INPC_E_NL_v,0)
x<- lag(INPC_E_NL_v,1)
y<- lag(INPC_E_NL_v,2)
z<- lag(INPC_E_NL_v,3)
INPC_E_NL_lags <- cbind(x,y,z)

fitINPC_E_NL1 <- auto.arima(INPC_E_NL_v2[4: 63,2], xreg=INPC_E_NL_lags[4: 63,1], d=0)
fitINPC_E_NL2 <- auto.arima(INPC_E_NL_v2[4: 63,2], xreg=INPC_E_NL_lags[4: 63,1:2], d=0)
fitINPC_E_NL3 <- auto.arima(INPC_E_NL_v2[4: 63,2], xreg=INPC_E_NL_lags[4: 63,1:3], d=0)
AIC_INPC_E_NL <- cbind(fitINPC_E_NL1$aic,fitINPC_E_NL2$aic,fitINPC_E_NL3$aic)
colnames(AIC_INPC_E_NL)<-c("1 lag","2 lags", "3 lags")
# M1 - NL
M1_NL_v<-as.vector(M1_NL)
CV_NL_v<-as.vector(CV_NL)
M1_NL_v2<-cbind(M1_NL_v,CV_NL_v)
colnames(M1_NL_v2)<-c("M1_NL","CV_NL")
a<- lag(M1_NL_v,0)
x<- lag(M1_NL_v,1)
y<- lag(M1_NL_v,2)
z<- lag(M1_NL_v,3)
M1_NL_lags <- cbind(x,y,z)

fitM1_NL1 <- auto.arima(M1_NL_v2[4: 63,2], xreg=M1_NL_lags[4: 63,1], d=0)
fitM1_NL2 <- auto.arima(M1_NL_v2[4: 63,2], xreg=M1_NL_lags[4: 63,1:2], d=0)
fitM1_NL3 <- auto.arima(M1_NL_v2[4: 63,2], xreg=M1_NL_lags[4: 63,1:3], d=0)
AIC_M1_NL <- cbind(fitM1_NL1$aic,fitM1_NL2$aic,fitM1_NL3$aic)
colnames(AIC_M1_NL)<-c("1 lag","2 lags", "3 lags")
# CONF - NL
CONF_NL_v<-as.vector(CONF_NL)
CV_NL_v<-as.vector(CV_NL)
CONF_NL_v2<-cbind(CONF_NL_v,CV_NL_v)
colnames(CONF_NL_v2)<-c("CONF_NL","CV_NL")
a<- lag(CONF_NL_v,0)
x<- lag(CONF_NL_v,1)
y<- lag(CONF_NL_v,2)
z<- lag(CONF_NL_v,3)
CONF_NL_lags <- cbind(x,y,z)

fitCONF_NL1 <- auto.arima(CONF_NL_v2[4: 63,2], xreg=CONF_NL_lags[4: 63,1], d=0)
fitCONF_NL2 <- auto.arima(CONF_NL_v2[4: 63,2], xreg=CONF_NL_lags[4: 63,1:2], d=0)
fitCONF_NL3 <- auto.arima(CONF_NL_v2[4: 63,2], xreg=CONF_NL_lags[4: 63,1:3], d=0)
AIC_CONF_NL <- cbind(fitCONF_NL1$aic,fitCONF_NL2$aic,fitCONF_NL3$aic)
colnames(AIC_CONF_NL)<-c("1 lag","2 lags", "3 lags")
```

```
AICs_NL<-rbind(AIC_IPV_NL,AIC_UNEMP_NL,AIC_REM_NL,AIC_GDP_NL,AIC_INPC_SUB_NL,AIC_INPC_E_NL,AIC_M1_NL,AI
rownames(AICs_NL)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_NL
```

```
##              1 lag   2 lags   3 lags
## IPV       27.91664 29.81892 31.81888
## DESEMPLEO 26.77051 28.76841 29.47885
## REMESAS   27.87964 29.85599 31.85594
## PIB       28.06874 26.50935 25.69312
## INPC_SUB  26.60691 27.93127 26.88398
## INPC_E    27.75670 29.74971 30.83004
## M1        27.93248 29.04142 30.02854
## CONF      28.24047 30.08463 31.96296
```

```
# OAXACA
# IPV - OAXACA
IPV_OAXACA_v<-as.vector(IPV_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
IPV_OAXACA_v2<-cbind(IPV_OAXACA_v,CV_OAXACA_v)
colnames(IPV_OAXACA_v2)<-c("IPV_OAXACA","CV_OAXACA")
a<- lag(IPV_OAXACA_v,0)
x<- lag(IPV_OAXACA_v,1)
y<- lag(IPV_OAXACA_v,2)
z<- lag(IPV_OAXACA_v,3)
IPV_OAXACA_lags <- cbind(x,y,z)

fitIPV_OAXACA1 <- auto.arima(IPV_OAXACA_v2[4: 63,2], xreg=IPV_OAXACA_lags[4: 63,1], d=0)
fitIPV_OAXACA2 <- auto.arima(IPV_OAXACA_v2[4: 63,2], xreg=IPV_OAXACA_lags[4: 63,1:2], d=0)
fitIPV_OAXACA3 <- auto.arima(IPV_OAXACA_v2[4: 63,2], xreg=IPV_OAXACA_lags[4: 63,1:3], d=0)
AIC_IPV_OAXACA <- cbind(fitIPV_OAXACA1$aic,fitIPV_OAXACA2$aic,fitIPV_OAXACA3$aic)
colnames(AIC_IPV_OAXACA)<-c("1 lag","2 lags", "3 lags")
# UNEMP - OAXACA
UNEMP_OAXACA_v<-as.vector(UNEMP_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
UNEMP_OAXACA_v2<-cbind(UNEMP_OAXACA_v,CV_OAXACA_v)
colnames(UNEMP_OAXACA_v2)<-c("UNEMP_OAXACA","CV_OAXACA")
a<- lag(UNEMP_OAXACA_v,0)
x<- lag(UNEMP_OAXACA_v,1)
y<- lag(UNEMP_OAXACA_v,2)
z<- lag(UNEMP_OAXACA_v,3)
UNEMP_OAXACA_lags <- cbind(x,y,z)

fitUNEMP_OAXACA1 <- auto.arima(UNEMP_OAXACA_v2[4: 63,2], xreg=UNEMP_OAXACA_lags[4: 63,1], d=0)
fitUNEMP_OAXACA2 <- auto.arima(UNEMP_OAXACA_v2[4: 63,2], xreg=UNEMP_OAXACA_lags[4: 63,1:2], d=0)
fitUNEMP_OAXACA3 <- auto.arima(UNEMP_OAXACA_v2[4: 63,2], xreg=UNEMP_OAXACA_lags[4: 63,1:3], d=0)
AIC_UNEMP_OAXACA <- cbind(fitUNEMP_OAXACA1$aic,fitUNEMP_OAXACA2$aic,fitUNEMP_OAXACA3$aic)
colnames(AIC_UNEMP_OAXACA)<-c("1 lag","2 lags", "3 lags")
# REM - OAXACA
REM_OAXACA_v<-as.vector(REM_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
REM_OAXACA_v2<-cbind(REM_OAXACA_v,CV_OAXACA_v)
colnames(REM_OAXACA_v2)<-c("REM_OAXACA","CV_OAXACA")
a<- lag(REM_OAXACA_v,0)
```

```
x<- lag(REM_OAXACA_v,1)
y<- lag(REM_OAXACA_v,2)
z<- lag(REM_OAXACA_v,3)
REM_OAXACA_lags <- cbind(x,y,z)

fitREM_OAXACA1 <- auto.arima(REM_OAXACA_v2[4: 63,2], xreg=REM_OAXACA_lags[4: 63,1], d=0)
fitREM_OAXACA2 <- auto.arima(REM_OAXACA_v2[4: 63,2], xreg=REM_OAXACA_lags[4: 63,1:2], d=0)
fitREM_OAXACA3 <- auto.arima(REM_OAXACA_v2[4: 63,2], xreg=REM_OAXACA_lags[4: 63,1:3], d=0)
AIC_REM_OAXACA <- cbind(fitREM_OAXACA1$aic,fitREM_OAXACA2$aic,fitREM_OAXACA3$aic)
colnames(AIC_REM_OAXACA)<-c("1 lag","2 lags", "3 lags")
# GDP - OAXACA
GDP_OAXACA_v<-as.vector(GDP_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
GDP_OAXACA_v2<-cbind(GDP_OAXACA_v,CV_OAXACA_v)
colnames(GDP_OAXACA_v2)<-c("GDP_OAXACA","CV_OAXACA")
a<- lag(GDP_OAXACA_v,0)
x<- lag(GDP_OAXACA_v,1)
y<- lag(GDP_OAXACA_v,2)
z<- lag(GDP_OAXACA_v,3)
GDP_OAXACA_lags <- cbind(x,y,z)

fitGDP_OAXACA1 <- auto.arima(GDP_OAXACA_v2[4: 63,2], xreg=GDP_OAXACA_lags[4: 63,1], d=0)
fitGDP_OAXACA2 <- auto.arima(GDP_OAXACA_v2[4: 63,2], xreg=GDP_OAXACA_lags[4: 63,1:2], d=0)
fitGDP_OAXACA3 <- auto.arima(GDP_OAXACA_v2[4: 63,2], xreg=GDP_OAXACA_lags[4: 63,1:3], d=0)
AIC_GDP_OAXACA <- cbind(fitGDP_OAXACA1$aic,fitGDP_OAXACA2$aic,fitGDP_OAXACA3$aic)
colnames(AIC_GDP_OAXACA)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - OAXACA
INPC_SUB_OAXACA_v<-as.vector(INPC_SUB_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
INPC_SUB_OAXACA_v2<-cbind(INPC_SUB_OAXACA_v,CV_OAXACA_v)
colnames(INPC_SUB_OAXACA_v2)<-c("INPC_SUB_OAXACA","CV_OAXACA")
a<- lag(INPC_SUB_OAXACA_v,0)
x<- lag(INPC_SUB_OAXACA_v,1)
y<- lag(INPC_SUB_OAXACA_v,2)
z<- lag(INPC_SUB_OAXACA_v,3)
INPC_SUB_OAXACA_lags <- cbind(x,y,z)

fitINPC_SUB_OAXACA1 <- auto.arima(INPC_SUB_OAXACA_v2[4: 63,2], xreg=INPC_SUB_OAXACA_lags[4: 63,1], d=0)
fitINPC_SUB_OAXACA2 <- auto.arima(INPC_SUB_OAXACA_v2[4: 63,2], xreg=INPC_SUB_OAXACA_lags[4: 63,1:2], d=
fitINPC_SUB_OAXACA3 <- auto.arima(INPC_SUB_OAXACA_v2[4: 63,2], xreg=INPC_SUB_OAXACA_lags[4: 63,1:3], d=
AIC_INPC_SUB_OAXACA <- cbind(fitINPC_SUB_OAXACA1$aic,fitINPC_SUB_OAXACA2$aic,fitINPC_SUB_OAXACA3$aic)
colnames(AIC_INPC_SUB_OAXACA)<-c("1 lag","2 lags", "3 lags")
# INPC_E - OAXACA
INPC_E_OAXACA_v<-as.vector(INPC_E_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
INPC_E_OAXACA_v2<-cbind(INPC_E_OAXACA_v,CV_OAXACA_v)
colnames(INPC_E_OAXACA_v2)<-c("INPC_E_OAXACA","CV_OAXACA")
a<- lag(INPC_E_OAXACA_v,0)
x<- lag(INPC_E_OAXACA_v,1)
y<- lag(INPC_E_OAXACA_v,2)
z<- lag(INPC_E_OAXACA_v,3)
INPC_E_OAXACA_lags <- cbind(x,y,z)
```

```r
fitINPC_E_OAXACA1 <- auto.arima(INPC_E_OAXACA_v2[4: 63,2], xreg=INPC_E_OAXACA_lags[4: 63,1], d=0)
fitINPC_E_OAXACA2 <- auto.arima(INPC_E_OAXACA_v2[4: 63,2], xreg=INPC_E_OAXACA_lags[4: 63,1:2], d=0)
fitINPC_E_OAXACA3 <- auto.arima(INPC_E_OAXACA_v2[4: 63,2], xreg=INPC_E_OAXACA_lags[4: 63,1:3], d=0)
AIC_INPC_E_OAXACA <- cbind(fitINPC_E_OAXACA1$aic,fitINPC_E_OAXACA2$aic,fitINPC_E_OAXACA3$aic)
colnames(AIC_INPC_E_OAXACA)<-c("1 lag","2 lags", "3 lags")
# M1 - OAXACA
M1_OAXACA_v<-as.vector(M1_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
M1_OAXACA_v2<-cbind(M1_OAXACA_v,CV_OAXACA_v)
colnames(M1_OAXACA_v2)<-c("M1_OAXACA","CV_OAXACA")
a<- lag(M1_OAXACA_v,0)
x<- lag(M1_OAXACA_v,1)
y<- lag(M1_OAXACA_v,2)
z<- lag(M1_OAXACA_v,3)
M1_OAXACA_lags <- cbind(x,y,z)

fitM1_OAXACA1 <- auto.arima(M1_OAXACA_v2[4: 63,2], xreg=M1_OAXACA_lags[4: 63,1], d=0)
fitM1_OAXACA2 <- auto.arima(M1_OAXACA_v2[4: 63,2], xreg=M1_OAXACA_lags[4: 63,1:2], d=0)
fitM1_OAXACA3 <- auto.arima(M1_OAXACA_v2[4: 63,2], xreg=M1_OAXACA_lags[4: 63,1:3], d=0)
AIC_M1_OAXACA <- cbind(fitM1_OAXACA1$aic,fitM1_OAXACA2$aic,fitM1_OAXACA3$aic)
colnames(AIC_M1_OAXACA)<-c("1 lag","2 lags", "3 lags")
# CONF - OAXACA
CONF_OAXACA_v<-as.vector(CONF_OAXACA)
CV_OAXACA_v<-as.vector(CV_OAXACA)
CONF_OAXACA_v2<-cbind(CONF_OAXACA_v,CV_OAXACA_v)
colnames(CONF_OAXACA_v2)<-c("CONF_OAXACA","CV_OAXACA")
a<- lag(CONF_OAXACA_v,0)
x<- lag(CONF_OAXACA_v,1)
y<- lag(CONF_OAXACA_v,2)
z<- lag(CONF_OAXACA_v,3)
CONF_OAXACA_lags <- cbind(x,y,z)

fitCONF_OAXACA1 <- auto.arima(CONF_OAXACA_v2[4: 63,2], xreg=CONF_OAXACA_lags[4: 63,1], d=0)
fitCONF_OAXACA2 <- auto.arima(CONF_OAXACA_v2[4: 63,2], xreg=CONF_OAXACA_lags[4: 63,1:2], d=0)
fitCONF_OAXACA3 <- auto.arima(CONF_OAXACA_v2[4: 63,2], xreg=CONF_OAXACA_lags[4: 63,1:3], d=0)
AIC_CONF_OAXACA <- cbind(fitCONF_OAXACA1$aic,fitCONF_OAXACA2$aic,fitCONF_OAXACA3$aic)
colnames(AIC_CONF_OAXACA)<-c("1 lag","2 lags", "3 lags")

AICs_OAXACA<-rbind(AIC_IPV_OAXACA,AIC_UNEMP_OAXACA,AIC_REM_OAXACA,AIC_GDP_OAXACA,AIC_INPC_SUB_OAXACA,AI
rownames(AICs_OAXACA)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_OAXACA
```

```
##              1 lag   2 lags   3 lags
## IPV       50.97055 52.77978 54.05479
## DESEMPLEO 50.99278 51.12288 53.12123
## REMESAS   51.41680 52.79110 54.66396
## PIB       51.48598 49.38172 50.58953
## INPC_SUB  50.67615 45.36073 47.14616
## INPC_E    51.46380 52.37506 53.93639
## M1        51.30333 53.21483 54.15333
## CONF      50.69910 48.95935 50.65010
```

```
# PUE
# IPV - PUE
IPV_PUE_v<-as.vector(IPV_PUE)
CV_PUE_v<-as.vector(CV_PUE)
IPV_PUE_v2<-cbind(IPV_PUE_v,CV_PUE_v)
colnames(IPV_PUE_v2)<-c("IPV_PUE","CV_PUE")
a<- lag(IPV_PUE_v,0)
x<- lag(IPV_PUE_v,1)
y<- lag(IPV_PUE_v,2)
z<- lag(IPV_PUE_v,3)
IPV_PUE_lags <- cbind(x,y,z)

fitIPV_PUE1 <- auto.arima(IPV_PUE_v2[4: 63,2], xreg=IPV_PUE_lags[4: 63,1], d=0)
fitIPV_PUE2 <- auto.arima(IPV_PUE_v2[4: 63,2], xreg=IPV_PUE_lags[4: 63,1:2], d=0)
fitIPV_PUE3 <- auto.arima(IPV_PUE_v2[4: 63,2], xreg=IPV_PUE_lags[4: 63,1:3], d=0)
AIC_IPV_PUE <- cbind(fitIPV_PUE1$aic,fitIPV_PUE2$aic,fitIPV_PUE3$aic)
colnames(AIC_IPV_PUE)<-c("1 lag","2 lags", "3 lags")
# UNEMP - PUE
UNEMP_PUE_v<-as.vector(UNEMP_PUE)
CV_PUE_v<-as.vector(CV_PUE)
UNEMP_PUE_v2<-cbind(UNEMP_PUE_v,CV_PUE_v)
colnames(UNEMP_PUE_v2)<-c("UNEMP_PUE","CV_PUE")
a<- lag(UNEMP_PUE_v,0)
x<- lag(UNEMP_PUE_v,1)
y<- lag(UNEMP_PUE_v,2)
z<- lag(UNEMP_PUE_v,3)
UNEMP_PUE_lags <- cbind(x,y,z)

fitUNEMP_PUE1 <- auto.arima(UNEMP_PUE_v2[4: 63,2], xreg=UNEMP_PUE_lags[4: 63,1], d=0)
fitUNEMP_PUE2 <- auto.arima(UNEMP_PUE_v2[4: 63,2], xreg=UNEMP_PUE_lags[4: 63,1:2], d=0)
fitUNEMP_PUE3 <- auto.arima(UNEMP_PUE_v2[4: 63,2], xreg=UNEMP_PUE_lags[4: 63,1:3], d=0)
AIC_UNEMP_PUE <- cbind(fitUNEMP_PUE1$aic,fitUNEMP_PUE2$aic,fitUNEMP_PUE3$aic)
colnames(AIC_UNEMP_PUE)<-c("1 lag","2 lags", "3 lags")
# REM - PUE
REM_PUE_v<-as.vector(REM_PUE)
CV_PUE_v<-as.vector(CV_PUE)
REM_PUE_v2<-cbind(REM_PUE_v,CV_PUE_v)
colnames(REM_PUE_v2)<-c("REM_PUE","CV_PUE")
a<- lag(REM_PUE_v,0)
x<- lag(REM_PUE_v,1)
y<- lag(REM_PUE_v,2)
z<- lag(REM_PUE_v,3)
REM_PUE_lags <- cbind(x,y,z)

fitREM_PUE1 <- auto.arima(REM_PUE_v2[4: 63,2], xreg=REM_PUE_lags[4: 63,1], d=0)
fitREM_PUE2 <- auto.arima(REM_PUE_v2[4: 63,2], xreg=REM_PUE_lags[4: 63,1:2], d=0)
fitREM_PUE3 <- auto.arima(REM_PUE_v2[4: 63,2], xreg=REM_PUE_lags[4: 63,1:3], d=0)
AIC_REM_PUE <- cbind(fitREM_PUE1$aic,fitREM_PUE2$aic,fitREM_PUE3$aic)
colnames(AIC_REM_PUE)<-c("1 lag","2 lags", "3 lags")
# GDP - PUE
GDP_PUE_v<-as.vector(GDP_PUE)
CV_PUE_v<-as.vector(CV_PUE)
GDP_PUE_v2<-cbind(GDP_PUE_v,CV_PUE_v)
```

```
colnames(GDP_PUE_v2)<-c("GDP_PUE","CV_PUE")
a<- lag(GDP_PUE_v,0)
x<- lag(GDP_PUE_v,1)
y<- lag(GDP_PUE_v,2)
z<- lag(GDP_PUE_v,3)
GDP_PUE_lags <- cbind(x,y,z)

fitGDP_PUE1 <- auto.arima(GDP_PUE_v2[4: 63,2], xreg=GDP_PUE_lags[4: 63,1], d=0)
fitGDP_PUE2 <- auto.arima(GDP_PUE_v2[4: 63,2], xreg=GDP_PUE_lags[4: 63,1:2], d=0)
fitGDP_PUE3 <- auto.arima(GDP_PUE_v2[4: 63,2], xreg=GDP_PUE_lags[4: 63,1:3], d=0)
AIC_GDP_PUE <- cbind(fitGDP_PUE1$aic,fitGDP_PUE2$aic,fitGDP_PUE3$aic)
colnames(AIC_GDP_PUE)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - PUE
INPC_SUB_PUE_v<-as.vector(INPC_SUB_PUE)
CV_PUE_v<-as.vector(CV_PUE)
INPC_SUB_PUE_v2<-cbind(INPC_SUB_PUE_v,CV_PUE_v)
colnames(INPC_SUB_PUE_v2)<-c("INPC_SUB_PUE","CV_PUE")
a<- lag(INPC_SUB_PUE_v,0)
x<- lag(INPC_SUB_PUE_v,1)
y<- lag(INPC_SUB_PUE_v,2)
z<- lag(INPC_SUB_PUE_v,3)
INPC_SUB_PUE_lags <- cbind(x,y,z)

fitINPC_SUB_PUE1 <- auto.arima(INPC_SUB_PUE_v2[4: 63,2], xreg=INPC_SUB_PUE_lags[4: 63,1], d=0)
fitINPC_SUB_PUE2 <- auto.arima(INPC_SUB_PUE_v2[4: 63,2], xreg=INPC_SUB_PUE_lags[4: 63,1:2], d=0)
fitINPC_SUB_PUE3 <- auto.arima(INPC_SUB_PUE_v2[4: 63,2], xreg=INPC_SUB_PUE_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_PUE <- cbind(fitINPC_SUB_PUE1$aic,fitINPC_SUB_PUE2$aic,fitINPC_SUB_PUE3$aic)
colnames(AIC_INPC_SUB_PUE)<-c("1 lag","2 lags", "3 lags")
# INPC_E - PUE
INPC_E_PUE_v<-as.vector(INPC_E_PUE)
CV_PUE_v<-as.vector(CV_PUE)
INPC_E_PUE_v2<-cbind(INPC_E_PUE_v,CV_PUE_v)
colnames(INPC_E_PUE_v2)<-c("INPC_E_PUE","CV_PUE")
a<- lag(INPC_E_PUE_v,0)
x<- lag(INPC_E_PUE_v,1)
y<- lag(INPC_E_PUE_v,2)
z<- lag(INPC_E_PUE_v,3)
INPC_E_PUE_lags <- cbind(x,y,z)

fitINPC_E_PUE1 <- auto.arima(INPC_E_PUE_v2[4: 63,2], xreg=INPC_E_PUE_lags[4: 63,1], d=0)
fitINPC_E_PUE2 <- auto.arima(INPC_E_PUE_v2[4: 63,2], xreg=INPC_E_PUE_lags[4: 63,1:2], d=0)
fitINPC_E_PUE3 <- auto.arima(INPC_E_PUE_v2[4: 63,2], xreg=INPC_E_PUE_lags[4: 63,1:3], d=0)
AIC_INPC_E_PUE <- cbind(fitINPC_E_PUE1$aic,fitINPC_E_PUE2$aic,fitINPC_E_PUE3$aic)
colnames(AIC_INPC_E_PUE)<-c("1 lag","2 lags", "3 lags")
# M1 - PUE
M1_PUE_v<-as.vector(M1_PUE)
CV_PUE_v<-as.vector(CV_PUE)
M1_PUE_v2<-cbind(M1_PUE_v,CV_PUE_v)
colnames(M1_PUE_v2)<-c("M1_PUE","CV_PUE")
a<- lag(M1_PUE_v,0)
x<- lag(M1_PUE_v,1)
y<- lag(M1_PUE_v,2)
z<- lag(M1_PUE_v,3)
```

```
M1_PUE_lags <- cbind(x,y,z)

fitM1_PUE1 <- auto.arima(M1_PUE_v2[4: 63,2], xreg=M1_PUE_lags[4: 63,1], d=0)
fitM1_PUE2 <- auto.arima(M1_PUE_v2[4: 63,2], xreg=M1_PUE_lags[4: 63,1:2], d=0)
fitM1_PUE3 <- auto.arima(M1_PUE_v2[4: 63,2], xreg=M1_PUE_lags[4: 63,1:3], d=0)
AIC_M1_PUE <- cbind(fitM1_PUE1$aic,fitM1_PUE2$aic,fitM1_PUE3$aic)
colnames(AIC_M1_PUE)<-c("1 lag","2 lags", "3 lags")
# CONF - PUE
CONF_PUE_v<-as.vector(CONF_PUE)
CV_PUE_v<-as.vector(CV_PUE)
CONF_PUE_v2<-cbind(CONF_PUE_v,CV_PUE_v)
colnames(CONF_PUE_v2)<-c("CONF_PUE","CV_PUE")
a<- lag(CONF_PUE_v,0)
x<- lag(CONF_PUE_v,1)
y<- lag(CONF_PUE_v,2)
z<- lag(CONF_PUE_v,3)
CONF_PUE_lags <- cbind(x,y,z)

fitCONF_PUE1 <- auto.arima(CONF_PUE_v2[4: 63,2], xreg=CONF_PUE_lags[4: 63,1], d=0)
fitCONF_PUE2 <- auto.arima(CONF_PUE_v2[4: 63,2], xreg=CONF_PUE_lags[4: 63,1:2], d=0)
fitCONF_PUE3 <- auto.arima(CONF_PUE_v2[4: 63,2], xreg=CONF_PUE_lags[4: 63,1:3], d=0)
AIC_CONF_PUE <- cbind(fitCONF_PUE1$aic,fitCONF_PUE2$aic,fitCONF_PUE3$aic)
colnames(AIC_CONF_PUE)<-c("1 lag","2 lags", "3 lags")

AICs_PUE<-rbind(AIC_IPV_PUE,AIC_UNEMP_PUE,AIC_REM_PUE,AIC_GDP_PUE,AIC_INPC_SUB_PUE,AIC_INPC_E_PUE,AIC_M
rownames(AICs_PUE)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_PUE
```

```
##              1 lag   2 lags   3 lags
## IPV       93.05632 94.29946 95.32468
## DESEMPLEO 88.45448 89.26389 91.14065
## REMESAS   90.68451 92.84193 93.92884
## PIB       93.29596 93.98603 95.39501
## INPC_SUB  88.15960 89.54619 90.91320
## INPC_E    92.29094 93.01584 94.87217
## M1        91.49781 91.51850 93.30744
## CONF      93.17895 94.30591 96.29658
```

```
# Q_ROO
# IPV - Q_ROO
IPV_Q_ROO_v<-as.vector(IPV_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
IPV_Q_ROO_v2<-cbind(IPV_Q_ROO_v,CV_Q_ROO_v)
colnames(IPV_Q_ROO_v2)<-c("IPV_Q_ROO","CV_Q_ROO")
a<- lag(IPV_Q_ROO_v,0)
x<- lag(IPV_Q_ROO_v,1)
y<- lag(IPV_Q_ROO_v,2)
z<- lag(IPV_Q_ROO_v,3)
IPV_Q_ROO_lags <- cbind(x,y,z)

fitIPV_Q_ROO1 <- auto.arima(IPV_Q_ROO_v2[4: 63,2], xreg=IPV_Q_ROO_lags[4: 63,1], d=0)
fitIPV_Q_ROO2 <- auto.arima(IPV_Q_ROO_v2[4: 63,2], xreg=IPV_Q_ROO_lags[4: 63,1:2], d=0)
fitIPV_Q_ROO3 <- auto.arima(IPV_Q_ROO_v2[4: 63,2], xreg=IPV_Q_ROO_lags[4: 63,1:3], d=0)
```

```
AIC_IPV_Q_ROO <- cbind(fitIPV_Q_ROO1$aic,fitIPV_Q_ROO2$aic,fitIPV_Q_ROO3$aic)
colnames(AIC_IPV_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - Q_ROO
UNEMP_Q_ROO_v<-as.vector(UNEMP_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
UNEMP_Q_ROO_v2<-cbind(UNEMP_Q_ROO_v,CV_Q_ROO_v)
colnames(UNEMP_Q_ROO_v2)<-c("UNEMP_Q_ROO","CV_Q_ROO")
a<- lag(UNEMP_Q_ROO_v,0)
x<- lag(UNEMP_Q_ROO_v,1)
y<- lag(UNEMP_Q_ROO_v,2)
z<- lag(UNEMP_Q_ROO_v,3)
UNEMP_Q_ROO_lags <- cbind(x,y,z)

fitUNEMP_Q_ROO1 <- auto.arima(UNEMP_Q_ROO_v2[4: 63,2], xreg=UNEMP_Q_ROO_lags[4: 63,1], d=0)
fitUNEMP_Q_ROO2 <- auto.arima(UNEMP_Q_ROO_v2[4: 63,2], xreg=UNEMP_Q_ROO_lags[4: 63,1:2], d=0)
fitUNEMP_Q_ROO3 <- auto.arima(UNEMP_Q_ROO_v2[4: 63,2], xreg=UNEMP_Q_ROO_lags[4: 63,1:3], d=0)
AIC_UNEMP_Q_ROO <- cbind(fitUNEMP_Q_ROO1$aic,fitUNEMP_Q_ROO2$aic,fitUNEMP_Q_ROO3$aic)
colnames(AIC_UNEMP_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# REM - Q_ROO
REM_Q_ROO_v<-as.vector(REM_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
REM_Q_ROO_v2<-cbind(REM_Q_ROO_v,CV_Q_ROO_v)
colnames(REM_Q_ROO_v2)<-c("REM_Q_ROO","CV_Q_ROO")
a<- lag(REM_Q_ROO_v,0)
x<- lag(REM_Q_ROO_v,1)
y<- lag(REM_Q_ROO_v,2)
z<- lag(REM_Q_ROO_v,3)
REM_Q_ROO_lags <- cbind(x,y,z)

fitREM_Q_ROO1 <- auto.arima(REM_Q_ROO_v2[4: 63,2], xreg=REM_Q_ROO_lags[4: 63,1], d=0)
fitREM_Q_ROO2 <- auto.arima(REM_Q_ROO_v2[4: 63,2], xreg=REM_Q_ROO_lags[4: 63,1:2], d=0)
fitREM_Q_ROO3 <- auto.arima(REM_Q_ROO_v2[4: 63,2], xreg=REM_Q_ROO_lags[4: 63,1:3], d=0)
AIC_REM_Q_ROO <- cbind(fitREM_Q_ROO1$aic,fitREM_Q_ROO2$aic,fitREM_Q_ROO3$aic)
colnames(AIC_REM_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# GDP - Q_ROO
GDP_Q_ROO_v<-as.vector(GDP_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
GDP_Q_ROO_v2<-cbind(GDP_Q_ROO_v,CV_Q_ROO_v)
colnames(GDP_Q_ROO_v2)<-c("GDP_Q_ROO","CV_Q_ROO")
a<- lag(GDP_Q_ROO_v,0)
x<- lag(GDP_Q_ROO_v,1)
y<- lag(GDP_Q_ROO_v,2)
z<- lag(GDP_Q_ROO_v,3)
GDP_Q_ROO_lags <- cbind(x,y,z)

fitGDP_Q_ROO1 <- auto.arima(GDP_Q_ROO_v2[4: 63,2], xreg=GDP_Q_ROO_lags[4: 63,1], d=0)
fitGDP_Q_ROO2 <- auto.arima(GDP_Q_ROO_v2[4: 63,2], xreg=GDP_Q_ROO_lags[4: 63,1:2], d=0)
fitGDP_Q_ROO3 <- auto.arima(GDP_Q_ROO_v2[4: 63,2], xreg=GDP_Q_ROO_lags[4: 63,1:3], d=0)
AIC_GDP_Q_ROO <- cbind(fitGDP_Q_ROO1$aic,fitGDP_Q_ROO2$aic,fitGDP_Q_ROO3$aic)
colnames(AIC_GDP_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - Q_ROO
INPC_SUB_Q_ROO_v<-as.vector(INPC_SUB_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
```

```
INPC_SUB_Q_ROO_v2<-cbind(INPC_SUB_Q_ROO_v,CV_Q_ROO_v)
colnames(INPC_SUB_Q_ROO_v2)<-c("INPC_SUB_Q_ROO","CV_Q_ROO")
a<- lag(INPC_SUB_Q_ROO_v,0)
x<- lag(INPC_SUB_Q_ROO_v,1)
y<- lag(INPC_SUB_Q_ROO_v,2)
z<- lag(INPC_SUB_Q_ROO_v,3)
INPC_SUB_Q_ROO_lags <- cbind(x,y,z)

fitINPC_SUB_Q_ROO1 <- auto.arima(INPC_SUB_Q_ROO_v2[4: 63,2], xreg=INPC_SUB_Q_ROO_lags[4: 63,1], d=0)
fitINPC_SUB_Q_ROO2 <- auto.arima(INPC_SUB_Q_ROO_v2[4: 63,2], xreg=INPC_SUB_Q_ROO_lags[4: 63,1:2], d=0)
fitINPC_SUB_Q_ROO3 <- auto.arima(INPC_SUB_Q_ROO_v2[4: 63,2], xreg=INPC_SUB_Q_ROO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_Q_ROO <- cbind(fitINPC_SUB_Q_ROO1$aic,fitINPC_SUB_Q_ROO2$aic,fitINPC_SUB_Q_ROO3$aic)
colnames(AIC_INPC_SUB_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - Q_ROO
INPC_E_Q_ROO_v<-as.vector(INPC_E_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
INPC_E_Q_ROO_v2<-cbind(INPC_E_Q_ROO_v,CV_Q_ROO_v)
colnames(INPC_E_Q_ROO_v2)<-c("INPC_E_Q_ROO","CV_Q_ROO")
a<- lag(INPC_E_Q_ROO_v,0)
x<- lag(INPC_E_Q_ROO_v,1)
y<- lag(INPC_E_Q_ROO_v,2)
z<- lag(INPC_E_Q_ROO_v,3)
INPC_E_Q_ROO_lags <- cbind(x,y,z)

fitINPC_E_Q_ROO1 <- auto.arima(INPC_E_Q_ROO_v2[4: 63,2], xreg=INPC_E_Q_ROO_lags[4: 63,1], d=0)
fitINPC_E_Q_ROO2 <- auto.arima(INPC_E_Q_ROO_v2[4: 63,2], xreg=INPC_E_Q_ROO_lags[4: 63,1:2], d=0)
fitINPC_E_Q_ROO3 <- auto.arima(INPC_E_Q_ROO_v2[4: 63,2], xreg=INPC_E_Q_ROO_lags[4: 63,1:3], d=0)
AIC_INPC_E_Q_ROO <- cbind(fitINPC_E_Q_ROO1$aic,fitINPC_E_Q_ROO2$aic,fitINPC_E_Q_ROO3$aic)
colnames(AIC_INPC_E_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# M1 - Q_ROO
M1_Q_ROO_v<-as.vector(M1_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
M1_Q_ROO_v2<-cbind(M1_Q_ROO_v,CV_Q_ROO_v)
colnames(M1_Q_ROO_v2)<-c("M1_Q_ROO","CV_Q_ROO")
a<- lag(M1_Q_ROO_v,0)
x<- lag(M1_Q_ROO_v,1)
y<- lag(M1_Q_ROO_v,2)
z<- lag(M1_Q_ROO_v,3)
M1_Q_ROO_lags <- cbind(x,y,z)

fitM1_Q_ROO1 <- auto.arima(M1_Q_ROO_v2[4: 63,2], xreg=M1_Q_ROO_lags[4: 63,1], d=0)
fitM1_Q_ROO2 <- auto.arima(M1_Q_ROO_v2[4: 63,2], xreg=M1_Q_ROO_lags[4: 63,1:2], d=0)
fitM1_Q_ROO3 <- auto.arima(M1_Q_ROO_v2[4: 63,2], xreg=M1_Q_ROO_lags[4: 63,1:3], d=0)
AIC_M1_Q_ROO <- cbind(fitM1_Q_ROO1$aic,fitM1_Q_ROO2$aic,fitM1_Q_ROO3$aic)
colnames(AIC_M1_Q_ROO)<-c("1 lag","2 lags", "3 lags")
# CONF - Q_ROO
CONF_Q_ROO_v<-as.vector(CONF_Q_ROO)
CV_Q_ROO_v<-as.vector(CV_Q_ROO)
CONF_Q_ROO_v2<-cbind(CONF_Q_ROO_v,CV_Q_ROO_v)
colnames(CONF_Q_ROO_v2)<-c("CONF_Q_ROO","CV_Q_ROO")
a<- lag(CONF_Q_ROO_v,0)
x<- lag(CONF_Q_ROO_v,1)
y<- lag(CONF_Q_ROO_v,2)
```

```
z<- lag(CONF_Q_ROO_v,3)
CONF_Q_ROO_lags <- cbind(x,y,z)

fitCONF_Q_ROO1 <- auto.arima(CONF_Q_ROO_v2[4: 63,2], xreg=CONF_Q_ROO_lags[4: 63,1], d=0)
fitCONF_Q_ROO2 <- auto.arima(CONF_Q_ROO_v2[4: 63,2], xreg=CONF_Q_ROO_lags[4: 63,1:2], d=0)
fitCONF_Q_ROO3 <- auto.arima(CONF_Q_ROO_v2[4: 63,2], xreg=CONF_Q_ROO_lags[4: 63,1:3], d=0)
AIC_CONF_Q_ROO <- cbind(fitCONF_Q_ROO1$aic,fitCONF_Q_ROO2$aic,fitCONF_Q_ROO3$aic)
colnames(AIC_CONF_Q_ROO)<-c("1 lag","2 lags", "3 lags")

AICs_Q_ROO<-rbind(AIC_IPV_Q_ROO,AIC_UNEMP_Q_ROO,AIC_REM_Q_ROO,AIC_GDP_Q_ROO,AIC_INPC_SUB_Q_ROO,AIC_INPC
rownames(AICs_Q_ROO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_Q_ROO
```

```
##              1 lag   2 lags   3 lags
## IPV       124.1075 125.6453 127.5628
## DESEMPLEO 123.9338 124.7459 126.5854
## REMESAS   124.0407 126.0406 127.9841
## PIB       124.0755 124.7131 126.2570
## INPC_SUB  123.3588 124.4151 126.4123
## INPC_E    124.1416 125.4001 127.0402
## M1        123.9530 125.5081 127.3221
## CONF      123.6141 124.2390 126.2374
```

```
# QRO
# IPV - QRO
IPV_QRO_v<-as.vector(IPV_QRO)
CV_QRO_v<-as.vector(CV_QRO)
IPV_QRO_v2<-cbind(IPV_QRO_v,CV_QRO_v)
colnames(IPV_QRO_v2)<-c("IPV_QRO","CV_QRO")
a<- lag(IPV_QRO_v,0)
x<- lag(IPV_QRO_v,1)
y<- lag(IPV_QRO_v,2)
z<- lag(IPV_QRO_v,3)
IPV_QRO_lags <- cbind(x,y,z)

fitIPV_QRO1 <- auto.arima(IPV_QRO_v2[4: 63,2], xreg=IPV_QRO_lags[4: 63,1], d=0)
fitIPV_QRO2 <- auto.arima(IPV_QRO_v2[4: 63,2], xreg=IPV_QRO_lags[4: 63,1:2], d=0)
fitIPV_QRO3 <- auto.arima(IPV_QRO_v2[4: 63,2], xreg=IPV_QRO_lags[4: 63,1:3], d=0)
AIC_IPV_QRO <- cbind(fitIPV_QRO1$aic,fitIPV_QRO2$aic,fitIPV_QRO3$aic)
colnames(AIC_IPV_QRO)<-c("1 lag","2 lags", "3 lags")
# UNEMP - QRO
UNEMP_QRO_v<-as.vector(UNEMP_QRO)
CV_QRO_v<-as.vector(CV_QRO)
UNEMP_QRO_v2<-cbind(UNEMP_QRO_v,CV_QRO_v)
colnames(UNEMP_QRO_v2)<-c("UNEMP_QRO","CV_QRO")
a<- lag(UNEMP_QRO_v,0)
x<- lag(UNEMP_QRO_v,1)
y<- lag(UNEMP_QRO_v,2)
z<- lag(UNEMP_QRO_v,3)
UNEMP_QRO_lags <- cbind(x,y,z)

fitUNEMP_QRO1 <- auto.arima(UNEMP_QRO_v2[4: 63,2], xreg=UNEMP_QRO_lags[4: 63,1], d=0)
fitUNEMP_QRO2 <- auto.arima(UNEMP_QRO_v2[4: 63,2], xreg=UNEMP_QRO_lags[4: 63,1:2], d=0)
```

```
fitUNEMP_QRO3 <- auto.arima(UNEMP_QRO_v2[4: 63,2], xreg=UNEMP_QRO_lags[4: 63,1:3], d=0)
AIC_UNEMP_QRO <- cbind(fitUNEMP_QRO1$aic,fitUNEMP_QRO2$aic,fitUNEMP_QRO3$aic)
colnames(AIC_UNEMP_QRO)<-c("1 lag","2 lags", "3 lags")
# REM - QRO
REM_QRO_v<-as.vector(REM_QRO)
CV_QRO_v<-as.vector(CV_QRO)
REM_QRO_v2<-cbind(REM_QRO_v,CV_QRO_v)
colnames(REM_QRO_v2)<-c("REM_QRO","CV_QRO")
a<- lag(REM_QRO_v,0)
x<- lag(REM_QRO_v,1)
y<- lag(REM_QRO_v,2)
z<- lag(REM_QRO_v,3)
REM_QRO_lags <- cbind(x,y,z)

fitREM_QRO1 <- auto.arima(REM_QRO_v2[4: 63,2], xreg=REM_QRO_lags[4: 63,1], d=0)
fitREM_QRO2 <- auto.arima(REM_QRO_v2[4: 63,2], xreg=REM_QRO_lags[4: 63,1:2], d=0)
fitREM_QRO3 <- auto.arima(REM_QRO_v2[4: 63,2], xreg=REM_QRO_lags[4: 63,1:3], d=0)
AIC_REM_QRO <- cbind(fitREM_QRO1$aic,fitREM_QRO2$aic,fitREM_QRO3$aic)
colnames(AIC_REM_QRO)<-c("1 lag","2 lags", "3 lags")
# GDP - QRO
GDP_QRO_v<-as.vector(GDP_QRO)
CV_QRO_v<-as.vector(CV_QRO)
GDP_QRO_v2<-cbind(GDP_QRO_v,CV_QRO_v)
colnames(GDP_QRO_v2)<-c("GDP_QRO","CV_QRO")
a<- lag(GDP_QRO_v,0)
x<- lag(GDP_QRO_v,1)
y<- lag(GDP_QRO_v,2)
z<- lag(GDP_QRO_v,3)
GDP_QRO_lags <- cbind(x,y,z)

fitGDP_QRO1 <- auto.arima(GDP_QRO_v2[4: 63,2], xreg=GDP_QRO_lags[4: 63,1], d=0)
fitGDP_QRO2 <- auto.arima(GDP_QRO_v2[4: 63,2], xreg=GDP_QRO_lags[4: 63,1:2], d=0)
fitGDP_QRO3 <- auto.arima(GDP_QRO_v2[4: 63,2], xreg=GDP_QRO_lags[4: 63,1:3], d=0)
AIC_GDP_QRO <- cbind(fitGDP_QRO1$aic,fitGDP_QRO2$aic,fitGDP_QRO3$aic)
colnames(AIC_GDP_QRO)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - QRO
INPC_SUB_QRO_v<-as.vector(INPC_SUB_QRO)
CV_QRO_v<-as.vector(CV_QRO)
INPC_SUB_QRO_v2<-cbind(INPC_SUB_QRO_v,CV_QRO_v)
colnames(INPC_SUB_QRO_v2)<-c("INPC_SUB_QRO","CV_QRO")
a<- lag(INPC_SUB_QRO_v,0)
x<- lag(INPC_SUB_QRO_v,1)
y<- lag(INPC_SUB_QRO_v,2)
z<- lag(INPC_SUB_QRO_v,3)
INPC_SUB_QRO_lags <- cbind(x,y,z)

fitINPC_SUB_QRO1 <- auto.arima(INPC_SUB_QRO_v2[4: 63,2], xreg=INPC_SUB_QRO_lags[4: 63,1], d=0)
fitINPC_SUB_QRO2 <- auto.arima(INPC_SUB_QRO_v2[4: 63,2], xreg=INPC_SUB_QRO_lags[4: 63,1:2], d=0)
fitINPC_SUB_QRO3 <- auto.arima(INPC_SUB_QRO_v2[4: 63,2], xreg=INPC_SUB_QRO_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_QRO <- cbind(fitINPC_SUB_QRO1$aic,fitINPC_SUB_QRO2$aic,fitINPC_SUB_QRO3$aic)
colnames(AIC_INPC_SUB_QRO)<-c("1 lag","2 lags", "3 lags")
# INPC_E - QRO
INPC_E_QRO_v<-as.vector(INPC_E_QRO)
```

```
CV_QRO_v<-as.vector(CV_QRO)
INPC_E_QRO_v2<-cbind(INPC_E_QRO_v,CV_QRO_v)
colnames(INPC_E_QRO_v2)<-c("INPC_E_QRO","CV_QRO")
a<- lag(INPC_E_QRO_v,0)
x<- lag(INPC_E_QRO_v,1)
y<- lag(INPC_E_QRO_v,2)
z<- lag(INPC_E_QRO_v,3)
INPC_E_QRO_lags <- cbind(x,y,z)

fitINPC_E_QRO1 <- auto.arima(INPC_E_QRO_v2[4: 63,2], xreg=INPC_E_QRO_lags[4: 63,1], d=0)
fitINPC_E_QRO2 <- auto.arima(INPC_E_QRO_v2[4: 63,2], xreg=INPC_E_QRO_lags[4: 63,1:2], d=0)
fitINPC_E_QRO3 <- auto.arima(INPC_E_QRO_v2[4: 63,2], xreg=INPC_E_QRO_lags[4: 63,1:3], d=0)
AIC_INPC_E_QRO <- cbind(fitINPC_E_QRO1$aic,fitINPC_E_QRO2$aic,fitINPC_E_QRO3$aic)
colnames(AIC_INPC_E_QRO)<-c("1 lag","2 lags", "3 lags")
# M1 - QRO
M1_QRO_v<-as.vector(M1_QRO)
CV_QRO_v<-as.vector(CV_QRO)
M1_QRO_v2<-cbind(M1_QRO_v,CV_QRO_v)
colnames(M1_QRO_v2)<-c("M1_QRO","CV_QRO")
a<- lag(M1_QRO_v,0)
x<- lag(M1_QRO_v,1)
y<- lag(M1_QRO_v,2)
z<- lag(M1_QRO_v,3)
M1_QRO_lags <- cbind(x,y,z)

fitM1_QRO1 <- auto.arima(M1_QRO_v2[4: 63,2], xreg=M1_QRO_lags[4: 63,1], d=0)
fitM1_QRO2 <- auto.arima(M1_QRO_v2[4: 63,2], xreg=M1_QRO_lags[4: 63,1:2], d=0)
fitM1_QRO3 <- auto.arima(M1_QRO_v2[4: 63,2], xreg=M1_QRO_lags[4: 63,1:3], d=0)
AIC_M1_QRO <- cbind(fitM1_QRO1$aic,fitM1_QRO2$aic,fitM1_QRO3$aic)
colnames(AIC_M1_QRO)<-c("1 lag","2 lags", "3 lags")
# CONF - QRO
CONF_QRO_v<-as.vector(CONF_QRO)
CV_QRO_v<-as.vector(CV_QRO)
CONF_QRO_v2<-cbind(CONF_QRO_v,CV_QRO_v)
colnames(CONF_QRO_v2)<-c("CONF_QRO","CV_QRO")
a<- lag(CONF_QRO_v,0)
x<- lag(CONF_QRO_v,1)
y<- lag(CONF_QRO_v,2)
z<- lag(CONF_QRO_v,3)
CONF_QRO_lags <- cbind(x,y,z)

fitCONF_QRO1 <- auto.arima(CONF_QRO_v2[4: 63,2], xreg=CONF_QRO_lags[4: 63,1], d=0)
fitCONF_QRO2 <- auto.arima(CONF_QRO_v2[4: 63,2], xreg=CONF_QRO_lags[4: 63,1:2], d=0)
fitCONF_QRO3 <- auto.arima(CONF_QRO_v2[4: 63,2], xreg=CONF_QRO_lags[4: 63,1:3], d=0)
AIC_CONF_QRO <- cbind(fitCONF_QRO1$aic,fitCONF_QRO2$aic,fitCONF_QRO3$aic)
colnames(AIC_CONF_QRO)<-c("1 lag","2 lags", "3 lags")

AICs_QRO<-rbind(AIC_IPV_QRO,AIC_UNEMP_QRO,AIC_REM_QRO,AIC_GDP_QRO,AIC_INPC_SUB_QRO,AIC_INPC_E_QRO,AIC_M
rownames(AICs_QRO)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_QRO
```

```
##             1 lag   2 lags   3 lags
## IPV      36.23999 38.23602 40.06266
```

```
## DESEMPLEO 36.59644 37.84544 38.58192
## REMESAS   33.62068 35.52356 35.92050
## PIB       35.33403 36.57866 38.23419
## INPC_SUB  36.64465 38.63340 39.94050
## INPC_E    35.81257 37.66150 39.43283
## M1        35.87642 37.86784 39.86539
## CONF      36.58453 38.42022 40.22767
```

```
# SIN
# IPV - SIN
IPV_SIN_v<-as.vector(IPV_SIN)
CV_SIN_v<-as.vector(CV_SIN)
IPV_SIN_v2<-cbind(IPV_SIN_v,CV_SIN_v)
colnames(IPV_SIN_v2)<-c("IPV_SIN","CV_SIN")
a<- lag(IPV_SIN_v,0)
x<- lag(IPV_SIN_v,1)
y<- lag(IPV_SIN_v,2)
z<- lag(IPV_SIN_v,3)
IPV_SIN_lags <- cbind(x,y,z)

fitIPV_SIN1 <- auto.arima(IPV_SIN_v2[4: 63,2], xreg=IPV_SIN_lags[4: 63,1], d=0)
fitIPV_SIN2 <- auto.arima(IPV_SIN_v2[4: 63,2], xreg=IPV_SIN_lags[4: 63,1:2], d=0)
fitIPV_SIN3 <- auto.arima(IPV_SIN_v2[4: 63,2], xreg=IPV_SIN_lags[4: 63,1:3], d=0)
AIC_IPV_SIN <- cbind(fitIPV_SIN1$aic,fitIPV_SIN2$aic,fitIPV_SIN3$aic)
colnames(AIC_IPV_SIN)<-c("1 lag","2 lags", "3 lags")
# UNEMP - SIN
UNEMP_SIN_v<-as.vector(UNEMP_SIN)
CV_SIN_v<-as.vector(CV_SIN)
UNEMP_SIN_v2<-cbind(UNEMP_SIN_v,CV_SIN_v)
colnames(UNEMP_SIN_v2)<-c("UNEMP_SIN","CV_SIN")
a<- lag(UNEMP_SIN_v,0)
x<- lag(UNEMP_SIN_v,1)
y<- lag(UNEMP_SIN_v,2)
z<- lag(UNEMP_SIN_v,3)
UNEMP_SIN_lags <- cbind(x,y,z)

fitUNEMP_SIN1 <- auto.arima(UNEMP_SIN_v2[4: 63,2], xreg=UNEMP_SIN_lags[4: 63,1], d=0)
fitUNEMP_SIN2 <- auto.arima(UNEMP_SIN_v2[4: 63,2], xreg=UNEMP_SIN_lags[4: 63,1:2], d=0)
fitUNEMP_SIN3 <- auto.arima(UNEMP_SIN_v2[4: 63,2], xreg=UNEMP_SIN_lags[4: 63,1:3], d=0)
AIC_UNEMP_SIN <- cbind(fitUNEMP_SIN1$aic,fitUNEMP_SIN2$aic,fitUNEMP_SIN3$aic)
colnames(AIC_UNEMP_SIN)<-c("1 lag","2 lags", "3 lags")
# REM - SIN
REM_SIN_v<-as.vector(REM_SIN)
CV_SIN_v<-as.vector(CV_SIN)
REM_SIN_v2<-cbind(REM_SIN_v,CV_SIN_v)
colnames(REM_SIN_v2)<-c("REM_SIN","CV_SIN")
a<- lag(REM_SIN_v,0)
x<- lag(REM_SIN_v,1)
y<- lag(REM_SIN_v,2)
z<- lag(REM_SIN_v,3)
REM_SIN_lags <- cbind(x,y,z)

fitREM_SIN1 <- auto.arima(REM_SIN_v2[4: 63,2], xreg=REM_SIN_lags[4: 63,1], d=0)
fitREM_SIN2 <- auto.arima(REM_SIN_v2[4: 63,2], xreg=REM_SIN_lags[4: 63,1:2], d=0)
```

```
fitREM_SIN3 <- auto.arima(REM_SIN_v2[4: 63,2], xreg=REM_SIN_lags[4: 63,1:3], d=0)
AIC_REM_SIN <- cbind(fitREM_SIN1$aic,fitREM_SIN2$aic,fitREM_SIN3$aic)
colnames(AIC_REM_SIN)<-c("1 lag","2 lags", "3 lags")
# GDP - SIN
GDP_SIN_v<-as.vector(GDP_SIN)
CV_SIN_v<-as.vector(CV_SIN)
GDP_SIN_v2<-cbind(GDP_SIN_v,CV_SIN_v)
colnames(GDP_SIN_v2)<-c("GDP_SIN","CV_SIN")
a<- lag(GDP_SIN_v,0)
x<- lag(GDP_SIN_v,1)
y<- lag(GDP_SIN_v,2)
z<- lag(GDP_SIN_v,3)
GDP_SIN_lags <- cbind(x,y,z)

fitGDP_SIN1 <- auto.arima(GDP_SIN_v2[4: 63,2], xreg=GDP_SIN_lags[4: 63,1], d=0)
fitGDP_SIN2 <- auto.arima(GDP_SIN_v2[4: 63,2], xreg=GDP_SIN_lags[4: 63,1:2], d=0)
fitGDP_SIN3 <- auto.arima(GDP_SIN_v2[4: 63,2], xreg=GDP_SIN_lags[4: 63,1:3], d=0)
AIC_GDP_SIN <- cbind(fitGDP_SIN1$aic,fitGDP_SIN2$aic,fitGDP_SIN3$aic)
colnames(AIC_GDP_SIN)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - SIN
INPC_SUB_SIN_v<-as.vector(INPC_SUB_SIN)
CV_SIN_v<-as.vector(CV_SIN)
INPC_SUB_SIN_v2<-cbind(INPC_SUB_SIN_v,CV_SIN_v)
colnames(INPC_SUB_SIN_v2)<-c("INPC_SUB_SIN","CV_SIN")
a<- lag(INPC_SUB_SIN_v,0)
x<- lag(INPC_SUB_SIN_v,1)
y<- lag(INPC_SUB_SIN_v,2)
z<- lag(INPC_SUB_SIN_v,3)
INPC_SUB_SIN_lags <- cbind(x,y,z)

fitINPC_SUB_SIN1 <- auto.arima(INPC_SUB_SIN_v2[4: 63,2], xreg=INPC_SUB_SIN_lags[4: 63,1], d=0)
fitINPC_SUB_SIN2 <- auto.arima(INPC_SUB_SIN_v2[4: 63,2], xreg=INPC_SUB_SIN_lags[4: 63,1:2], d=0)
fitINPC_SUB_SIN3 <- auto.arima(INPC_SUB_SIN_v2[4: 63,2], xreg=INPC_SUB_SIN_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_SIN <- cbind(fitINPC_SUB_SIN1$aic,fitINPC_SUB_SIN2$aic,fitINPC_SUB_SIN3$aic)
colnames(AIC_INPC_SUB_SIN)<-c("1 lag","2 lags", "3 lags")
# INPC_E - SIN
INPC_E_SIN_v<-as.vector(INPC_E_SIN)
CV_SIN_v<-as.vector(CV_SIN)
INPC_E_SIN_v2<-cbind(INPC_E_SIN_v,CV_SIN_v)
colnames(INPC_E_SIN_v2)<-c("INPC_E_SIN","CV_SIN")
a<- lag(INPC_E_SIN_v,0)
x<- lag(INPC_E_SIN_v,1)
y<- lag(INPC_E_SIN_v,2)
z<- lag(INPC_E_SIN_v,3)
INPC_E_SIN_lags <- cbind(x,y,z)

fitINPC_E_SIN1 <- auto.arima(INPC_E_SIN_v2[4: 63,2], xreg=INPC_E_SIN_lags[4: 63,1], d=0)
fitINPC_E_SIN2 <- auto.arima(INPC_E_SIN_v2[4: 63,2], xreg=INPC_E_SIN_lags[4: 63,1:2], d=0)
fitINPC_E_SIN3 <- auto.arima(INPC_E_SIN_v2[4: 63,2], xreg=INPC_E_SIN_lags[4: 63,1:3], d=0)
AIC_INPC_E_SIN <- cbind(fitINPC_E_SIN1$aic,fitINPC_E_SIN2$aic,fitINPC_E_SIN3$aic)
colnames(AIC_INPC_E_SIN)<-c("1 lag","2 lags", "3 lags")
# M1 - SIN
M1_SIN_v<-as.vector(M1_SIN)
```

```r
CV_SIN_v<-as.vector(CV_SIN)
M1_SIN_v2<-cbind(M1_SIN_v,CV_SIN_v)
colnames(M1_SIN_v2)<-c("M1_SIN","CV_SIN")
a<- lag(M1_SIN_v,0)
x<- lag(M1_SIN_v,1)
y<- lag(M1_SIN_v,2)
z<- lag(M1_SIN_v,3)
M1_SIN_lags <- cbind(x,y,z)

fitM1_SIN1 <- auto.arima(M1_SIN_v2[4: 63,2], xreg=M1_SIN_lags[4: 63,1], d=0)
fitM1_SIN2 <- auto.arima(M1_SIN_v2[4: 63,2], xreg=M1_SIN_lags[4: 63,1:2], d=0)
fitM1_SIN3 <- auto.arima(M1_SIN_v2[4: 63,2], xreg=M1_SIN_lags[4: 63,1:3], d=0)
AIC_M1_SIN <- cbind(fitM1_SIN1$aic,fitM1_SIN2$aic,fitM1_SIN3$aic)
colnames(AIC_M1_SIN)<-c("1 lag","2 lags", "3 lags")
# CONF - SIN
CONF_SIN_v<-as.vector(CONF_SIN)
CV_SIN_v<-as.vector(CV_SIN)
CONF_SIN_v2<-cbind(CONF_SIN_v,CV_SIN_v)
colnames(CONF_SIN_v2)<-c("CONF_SIN","CV_SIN")
a<- lag(CONF_SIN_v,0)
x<- lag(CONF_SIN_v,1)
y<- lag(CONF_SIN_v,2)
z<- lag(CONF_SIN_v,3)
CONF_SIN_lags <- cbind(x,y,z)

fitCONF_SIN1 <- auto.arima(CONF_SIN_v2[4: 63,2], xreg=CONF_SIN_lags[4: 63,1], d=0)
fitCONF_SIN2 <- auto.arima(CONF_SIN_v2[4: 63,2], xreg=CONF_SIN_lags[4: 63,1:2], d=0)
fitCONF_SIN3 <- auto.arima(CONF_SIN_v2[4: 63,2], xreg=CONF_SIN_lags[4: 63,1:3], d=0)
AIC_CONF_SIN <- cbind(fitCONF_SIN1$aic,fitCONF_SIN2$aic,fitCONF_SIN3$aic)
colnames(AIC_CONF_SIN)<-c("1 lag","2 lags", "3 lags")

AICs_SIN<-rbind(AIC_IPV_SIN,AIC_UNEMP_SIN,AIC_REM_SIN,AIC_GDP_SIN,AIC_INPC_SUB_SIN,AIC_INPC_E_SIN,AIC_M
rownames(AICs_SIN)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_SIN
```

```
##              1 lag   2 lags   3 lags
## IPV       109.8833 110.1434 109.8640
## DESEMPLEO 110.9985 112.1244 111.4025
## REMESAS   111.6592 113.6091 114.0484
## PIB       111.2637 112.5302 113.6719
## INPC_SUB  107.7823 109.3287 110.6592
## INPC_E    111.1754 111.4510 113.4330
## M1        111.2955 111.2097 112.7072
## CONF      111.6856 112.1989 114.1782
```

```r
# SLP
# IPV - SLP
IPV_SLP_v<-as.vector(IPV_SLP)
CV_SLP_v<-as.vector(CV_SLP)
IPV_SLP_v2<-cbind(IPV_SLP_v,CV_SLP_v)
colnames(IPV_SLP_v2)<-c("IPV_SLP","CV_SLP")
a<- lag(IPV_SLP_v,0)
x<- lag(IPV_SLP_v,1)
```

```
y<- lag(IPV_SLP_v,2)
z<- lag(IPV_SLP_v,3)
IPV_SLP_lags <- cbind(x,y,z)

fitIPV_SLP1 <- auto.arima(IPV_SLP_v2[4: 63,2], xreg=IPV_SLP_lags[4: 63,1], d=0)
fitIPV_SLP2 <- auto.arima(IPV_SLP_v2[4: 63,2], xreg=IPV_SLP_lags[4: 63,1:2], d=0)
fitIPV_SLP3 <- auto.arima(IPV_SLP_v2[4: 63,2], xreg=IPV_SLP_lags[4: 63,1:3], d=0)
AIC_IPV_SLP <- cbind(fitIPV_SLP1$aic,fitIPV_SLP2$aic,fitIPV_SLP3$aic)
colnames(AIC_IPV_SLP)<-c("1 lag","2 lags", "3 lags")
# UNEMP - SLP
UNEMP_SLP_v<-as.vector(UNEMP_SLP)
CV_SLP_v<-as.vector(CV_SLP)
UNEMP_SLP_v2<-cbind(UNEMP_SLP_v,CV_SLP_v)
colnames(UNEMP_SLP_v2)<-c("UNEMP_SLP","CV_SLP")
a<- lag(UNEMP_SLP_v,0)
x<- lag(UNEMP_SLP_v,1)
y<- lag(UNEMP_SLP_v,2)
z<- lag(UNEMP_SLP_v,3)
UNEMP_SLP_lags <- cbind(x,y,z)

fitUNEMP_SLP1 <- auto.arima(UNEMP_SLP_v2[4: 63,2], xreg=UNEMP_SLP_lags[4: 63,1], d=0)
fitUNEMP_SLP2 <- auto.arima(UNEMP_SLP_v2[4: 63,2], xreg=UNEMP_SLP_lags[4: 63,1:2], d=0)
fitUNEMP_SLP3 <- auto.arima(UNEMP_SLP_v2[4: 63,2], xreg=UNEMP_SLP_lags[4: 63,1:3], d=0)
AIC_UNEMP_SLP <- cbind(fitUNEMP_SLP1$aic,fitUNEMP_SLP2$aic,fitUNEMP_SLP3$aic)
colnames(AIC_UNEMP_SLP)<-c("1 lag","2 lags", "3 lags")
# REM - SLP
REM_SLP_v<-as.vector(REM_SLP)
CV_SLP_v<-as.vector(CV_SLP)
REM_SLP_v2<-cbind(REM_SLP_v,CV_SLP_v)
colnames(REM_SLP_v2)<-c("REM_SLP","CV_SLP")
a<- lag(REM_SLP_v,0)
x<- lag(REM_SLP_v,1)
y<- lag(REM_SLP_v,2)
z<- lag(REM_SLP_v,3)
REM_SLP_lags <- cbind(x,y,z)

fitREM_SLP1 <- auto.arima(REM_SLP_v2[4: 63,2], xreg=REM_SLP_lags[4: 63,1], d=0)
fitREM_SLP2 <- auto.arima(REM_SLP_v2[4: 63,2], xreg=REM_SLP_lags[4: 63,1:2], d=0)
fitREM_SLP3 <- auto.arima(REM_SLP_v2[4: 63,2], xreg=REM_SLP_lags[4: 63,1:3], d=0)
AIC_REM_SLP <- cbind(fitREM_SLP1$aic,fitREM_SLP2$aic,fitREM_SLP3$aic)
colnames(AIC_REM_SLP)<-c("1 lag","2 lags", "3 lags")
# GDP - SLP
GDP_SLP_v<-as.vector(GDP_SLP)
CV_SLP_v<-as.vector(CV_SLP)
GDP_SLP_v2<-cbind(GDP_SLP_v,CV_SLP_v)
colnames(GDP_SLP_v2)<-c("GDP_SLP","CV_SLP")
a<- lag(GDP_SLP_v,0)
x<- lag(GDP_SLP_v,1)
y<- lag(GDP_SLP_v,2)
z<- lag(GDP_SLP_v,3)
GDP_SLP_lags <- cbind(x,y,z)

fitGDP_SLP1 <- auto.arima(GDP_SLP_v2[4: 63,2], xreg=GDP_SLP_lags[4: 63,1], d=0)
```

```
fitGDP_SLP2 <- auto.arima(GDP_SLP_v2[4: 63,2], xreg=GDP_SLP_lags[4: 63,1:2], d=0)
fitGDP_SLP3 <- auto.arima(GDP_SLP_v2[4: 63,2], xreg=GDP_SLP_lags[4: 63,1:3], d=0)
AIC_GDP_SLP <- cbind(fitGDP_SLP1$aic,fitGDP_SLP2$aic,fitGDP_SLP3$aic)
colnames(AIC_GDP_SLP)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - SLP
INPC_SUB_SLP_v<-as.vector(INPC_SUB_SLP)
CV_SLP_v<-as.vector(CV_SLP)
INPC_SUB_SLP_v2<-cbind(INPC_SUB_SLP_v,CV_SLP_v)
colnames(INPC_SUB_SLP_v2)<-c("INPC_SUB_SLP","CV_SLP")
a<- lag(INPC_SUB_SLP_v,0)
x<- lag(INPC_SUB_SLP_v,1)
y<- lag(INPC_SUB_SLP_v,2)
z<- lag(INPC_SUB_SLP_v,3)
INPC_SUB_SLP_lags <- cbind(x,y,z)

fitINPC_SUB_SLP1 <- auto.arima(INPC_SUB_SLP_v2[4: 63,2], xreg=INPC_SUB_SLP_lags[4: 63,1], d=0)
fitINPC_SUB_SLP2 <- auto.arima(INPC_SUB_SLP_v2[4: 63,2], xreg=INPC_SUB_SLP_lags[4: 63,1:2], d=0)
fitINPC_SUB_SLP3 <- auto.arima(INPC_SUB_SLP_v2[4: 63,2], xreg=INPC_SUB_SLP_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_SLP <- cbind(fitINPC_SUB_SLP1$aic,fitINPC_SUB_SLP2$aic,fitINPC_SUB_SLP3$aic)
colnames(AIC_INPC_SUB_SLP)<-c("1 lag","2 lags", "3 lags")
# INPC_E - SLP
INPC_E_SLP_v<-as.vector(INPC_E_SLP)
CV_SLP_v<-as.vector(CV_SLP)
INPC_E_SLP_v2<-cbind(INPC_E_SLP_v,CV_SLP_v)
colnames(INPC_E_SLP_v2)<-c("INPC_E_SLP","CV_SLP")
a<- lag(INPC_E_SLP_v,0)
x<- lag(INPC_E_SLP_v,1)
y<- lag(INPC_E_SLP_v,2)
z<- lag(INPC_E_SLP_v,3)
INPC_E_SLP_lags <- cbind(x,y,z)

fitINPC_E_SLP1 <- auto.arima(INPC_E_SLP_v2[4: 63,2], xreg=INPC_E_SLP_lags[4: 63,1], d=0)
fitINPC_E_SLP2 <- auto.arima(INPC_E_SLP_v2[4: 63,2], xreg=INPC_E_SLP_lags[4: 63,1:2], d=0)
fitINPC_E_SLP3 <- auto.arima(INPC_E_SLP_v2[4: 63,2], xreg=INPC_E_SLP_lags[4: 63,1:3], d=0)
AIC_INPC_E_SLP <- cbind(fitINPC_E_SLP1$aic,fitINPC_E_SLP2$aic,fitINPC_E_SLP3$aic)
colnames(AIC_INPC_E_SLP)<-c("1 lag","2 lags", "3 lags")
# M1 - SLP
M1_SLP_v<-as.vector(M1_SLP)
CV_SLP_v<-as.vector(CV_SLP)
M1_SLP_v2<-cbind(M1_SLP_v,CV_SLP_v)
colnames(M1_SLP_v2)<-c("M1_SLP","CV_SLP")
a<- lag(M1_SLP_v,0)
x<- lag(M1_SLP_v,1)
y<- lag(M1_SLP_v,2)
z<- lag(M1_SLP_v,3)
M1_SLP_lags <- cbind(x,y,z)

fitM1_SLP1 <- auto.arima(M1_SLP_v2[4: 63,2], xreg=M1_SLP_lags[4: 63,1], d=0)
fitM1_SLP2 <- auto.arima(M1_SLP_v2[4: 63,2], xreg=M1_SLP_lags[4: 63,1:2], d=0)
fitM1_SLP3 <- auto.arima(M1_SLP_v2[4: 63,2], xreg=M1_SLP_lags[4: 63,1:3], d=0)
AIC_M1_SLP <- cbind(fitM1_SLP1$aic,fitM1_SLP2$aic,fitM1_SLP3$aic)
colnames(AIC_M1_SLP)<-c("1 lag","2 lags", "3 lags")
# CONF - SLP
```

```
CONF_SLP_v<-as.vector(CONF_SLP)
CV_SLP_v<-as.vector(CV_SLP)
CONF_SLP_v2<-cbind(CONF_SLP_v,CV_SLP_v)
colnames(CONF_SLP_v2)<-c("CONF_SLP","CV_SLP")
a<- lag(CONF_SLP_v,0)
x<- lag(CONF_SLP_v,1)
y<- lag(CONF_SLP_v,2)
z<- lag(CONF_SLP_v,3)
CONF_SLP_lags <- cbind(x,y,z)

fitCONF_SLP1 <- auto.arima(CONF_SLP_v2[4: 63,2], xreg=CONF_SLP_lags[4: 63,1], d=0)
fitCONF_SLP2 <- auto.arima(CONF_SLP_v2[4: 63,2], xreg=CONF_SLP_lags[4: 63,1:2], d=0)
fitCONF_SLP3 <- auto.arima(CONF_SLP_v2[4: 63,2], xreg=CONF_SLP_lags[4: 63,1:3], d=0)
AIC_CONF_SLP <- cbind(fitCONF_SLP1$aic,fitCONF_SLP2$aic,fitCONF_SLP3$aic)
colnames(AIC_CONF_SLP)<-c("1 lag","2 lags", "3 lags")

AICs_SLP<-rbind(AIC_IPV_SLP,AIC_UNEMP_SLP,AIC_REM_SLP,AIC_GDP_SLP,AIC_INPC_SUB_SLP,AIC_INPC_E_SLP,AIC_M
rownames(AICs_SLP)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_SLP
```

```
##              1 lag   2 lags   3 lags
## IPV       51.31384 53.30853 53.93792
## DESEMPLEO 51.86379 52.25101 53.56626
## REMESAS   51.85832 53.07697 55.07690
## PIB       51.78090 51.58975 52.90886
## INPC_SUB  51.66536 49.90256 50.04800
## INPC_E    51.37364 52.35814 54.33871
## M1        50.54858 51.87369 52.84159
## CONF      51.85126 52.99839 54.67651
```

```
# SON
# IPV - SON
IPV_SON_v<-as.vector(IPV_SON)
CV_SON_v<-as.vector(CV_SON)
IPV_SON_v2<-cbind(IPV_SON_v,CV_SON_v)
colnames(IPV_SON_v2)<-c("IPV_SON","CV_SON")
a<- lag(IPV_SON_v,0)
x<- lag(IPV_SON_v,1)
y<- lag(IPV_SON_v,2)
z<- lag(IPV_SON_v,3)
IPV_SON_lags <- cbind(x,y,z)

fitIPV_SON1 <- auto.arima(IPV_SON_v2[4: 63,2], xreg=IPV_SON_lags[4: 63,1], d=0)
fitIPV_SON2 <- auto.arima(IPV_SON_v2[4: 63,2], xreg=IPV_SON_lags[4: 63,1:2], d=0)
fitIPV_SON3 <- auto.arima(IPV_SON_v2[4: 63,2], xreg=IPV_SON_lags[4: 63,1:3], d=0)
AIC_IPV_SON <- cbind(fitIPV_SON1$aic,fitIPV_SON2$aic,fitIPV_SON3$aic)
colnames(AIC_IPV_SON)<-c("1 lag","2 lags", "3 lags")
# UNEMP - SON
UNEMP_SON_v<-as.vector(UNEMP_SON)
CV_SON_v<-as.vector(CV_SON)
UNEMP_SON_v2<-cbind(UNEMP_SON_v,CV_SON_v)
colnames(UNEMP_SON_v2)<-c("UNEMP_SON","CV_SON")
a<- lag(UNEMP_SON_v,0)
```

```
x<- lag(UNEMP_SON_v,1)
y<- lag(UNEMP_SON_v,2)
z<- lag(UNEMP_SON_v,3)
UNEMP_SON_lags <- cbind(x,y,z)

fitUNEMP_SON1 <- auto.arima(UNEMP_SON_v2[4: 63,2], xreg=UNEMP_SON_lags[4: 63,1], d=0)
fitUNEMP_SON2 <- auto.arima(UNEMP_SON_v2[4: 63,2], xreg=UNEMP_SON_lags[4: 63,1:2], d=0)
fitUNEMP_SON3 <- auto.arima(UNEMP_SON_v2[4: 63,2], xreg=UNEMP_SON_lags[4: 63,1:3], d=0)
AIC_UNEMP_SON <- cbind(fitUNEMP_SON1$aic,fitUNEMP_SON2$aic,fitUNEMP_SON3$aic)
colnames(AIC_UNEMP_SON)<-c("1 lag","2 lags", "3 lags")
# REM - SON
REM_SON_v<-as.vector(REM_SON)
CV_SON_v<-as.vector(CV_SON)
REM_SON_v2<-cbind(REM_SON_v,CV_SON_v)
colnames(REM_SON_v2)<-c("REM_SON","CV_SON")
a<- lag(REM_SON_v,0)
x<- lag(REM_SON_v,1)
y<- lag(REM_SON_v,2)
z<- lag(REM_SON_v,3)
REM_SON_lags <- cbind(x,y,z)

fitREM_SON1 <- auto.arima(REM_SON_v2[4: 63,2], xreg=REM_SON_lags[4: 63,1], d=0)
fitREM_SON2 <- auto.arima(REM_SON_v2[4: 63,2], xreg=REM_SON_lags[4: 63,1:2], d=0)
fitREM_SON3 <- auto.arima(REM_SON_v2[4: 63,2], xreg=REM_SON_lags[4: 63,1:3], d=0)
AIC_REM_SON <- cbind(fitREM_SON1$aic,fitREM_SON2$aic,fitREM_SON3$aic)
colnames(AIC_REM_SON)<-c("1 lag","2 lags", "3 lags")
# GDP - SON
GDP_SON_v<-as.vector(GDP_SON)
CV_SON_v<-as.vector(CV_SON)
GDP_SON_v2<-cbind(GDP_SON_v,CV_SON_v)
colnames(GDP_SON_v2)<-c("GDP_SON","CV_SON")
a<- lag(GDP_SON_v,0)
x<- lag(GDP_SON_v,1)
y<- lag(GDP_SON_v,2)
z<- lag(GDP_SON_v,3)
GDP_SON_lags <- cbind(x,y,z)

fitGDP_SON1 <- auto.arima(GDP_SON_v2[4: 63,2], xreg=GDP_SON_lags[4: 63,1], d=0)
fitGDP_SON2 <- auto.arima(GDP_SON_v2[4: 63,2], xreg=GDP_SON_lags[4: 63,1:2], d=0)
fitGDP_SON3 <- auto.arima(GDP_SON_v2[4: 63,2], xreg=GDP_SON_lags[4: 63,1:3], d=0)
AIC_GDP_SON <- cbind(fitGDP_SON1$aic,fitGDP_SON2$aic,fitGDP_SON3$aic)
colnames(AIC_GDP_SON)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - SON
INPC_SUB_SON_v<-as.vector(INPC_SUB_SON)
CV_SON_v<-as.vector(CV_SON)
INPC_SUB_SON_v2<-cbind(INPC_SUB_SON_v,CV_SON_v)
colnames(INPC_SUB_SON_v2)<-c("INPC_SUB_SON","CV_SON")
a<- lag(INPC_SUB_SON_v,0)
x<- lag(INPC_SUB_SON_v,1)
y<- lag(INPC_SUB_SON_v,2)
z<- lag(INPC_SUB_SON_v,3)
INPC_SUB_SON_lags <- cbind(x,y,z)
```

```
fitINPC_SUB_SON1 <- auto.arima(INPC_SUB_SON_v2[4: 63,2], xreg=INPC_SUB_SON_lags[4: 63,1], d=0)
fitINPC_SUB_SON2 <- auto.arima(INPC_SUB_SON_v2[4: 63,2], xreg=INPC_SUB_SON_lags[4: 63,1:2], d=0)
fitINPC_SUB_SON3 <- auto.arima(INPC_SUB_SON_v2[4: 63,2], xreg=INPC_SUB_SON_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_SON <- cbind(fitINPC_SUB_SON1$aic,fitINPC_SUB_SON2$aic,fitINPC_SUB_SON3$aic)
colnames(AIC_INPC_SUB_SON)<-c("1 lag","2 lags", "3 lags")
# INPC_E - SON
INPC_E_SON_v<-as.vector(INPC_E_SON)
CV_SON_v<-as.vector(CV_SON)
INPC_E_SON_v2<-cbind(INPC_E_SON_v,CV_SON_v)
colnames(INPC_E_SON_v2)<-c("INPC_E_SON","CV_SON")
a<- lag(INPC_E_SON_v,0)
x<- lag(INPC_E_SON_v,1)
y<- lag(INPC_E_SON_v,2)
z<- lag(INPC_E_SON_v,3)
INPC_E_SON_lags <- cbind(x,y,z)

fitINPC_E_SON1 <- auto.arima(INPC_E_SON_v2[4: 63,2], xreg=INPC_E_SON_lags[4: 63,1], d=0)
fitINPC_E_SON2 <- auto.arima(INPC_E_SON_v2[4: 63,2], xreg=INPC_E_SON_lags[4: 63,1:2], d=0)
fitINPC_E_SON3 <- auto.arima(INPC_E_SON_v2[4: 63,2], xreg=INPC_E_SON_lags[4: 63,1:3], d=0)
AIC_INPC_E_SON <- cbind(fitINPC_E_SON1$aic,fitINPC_E_SON2$aic,fitINPC_E_SON3$aic)
colnames(AIC_INPC_E_SON)<-c("1 lag","2 lags", "3 lags")
# M1 - SON
M1_SON_v<-as.vector(M1_SON)
CV_SON_v<-as.vector(CV_SON)
M1_SON_v2<-cbind(M1_SON_v,CV_SON_v)
colnames(M1_SON_v2)<-c("M1_SON","CV_SON")
a<- lag(M1_SON_v,0)
x<- lag(M1_SON_v,1)
y<- lag(M1_SON_v,2)
z<- lag(M1_SON_v,3)
M1_SON_lags <- cbind(x,y,z)

fitM1_SON1 <- auto.arima(M1_SON_v2[4: 63,2], xreg=M1_SON_lags[4: 63,1], d=0)
fitM1_SON2 <- auto.arima(M1_SON_v2[4: 63,2], xreg=M1_SON_lags[4: 63,1:2], d=0)
fitM1_SON3 <- auto.arima(M1_SON_v2[4: 63,2], xreg=M1_SON_lags[4: 63,1:3], d=0)
AIC_M1_SON <- cbind(fitM1_SON1$aic,fitM1_SON2$aic,fitM1_SON3$aic)
colnames(AIC_M1_SON)<-c("1 lag","2 lags", "3 lags")
# CONF - SON
CONF_SON_v<-as.vector(CONF_SON)
CV_SON_v<-as.vector(CV_SON)
CONF_SON_v2<-cbind(CONF_SON_v,CV_SON_v)
colnames(CONF_SON_v2)<-c("CONF_SON","CV_SON")
a<- lag(CONF_SON_v,0)
x<- lag(CONF_SON_v,1)
y<- lag(CONF_SON_v,2)
z<- lag(CONF_SON_v,3)
CONF_SON_lags <- cbind(x,y,z)

fitCONF_SON1 <- auto.arima(CONF_SON_v2[4: 63,2], xreg=CONF_SON_lags[4: 63,1], d=0)
fitCONF_SON2 <- auto.arima(CONF_SON_v2[4: 63,2], xreg=CONF_SON_lags[4: 63,1:2], d=0)
fitCONF_SON3 <- auto.arima(CONF_SON_v2[4: 63,2], xreg=CONF_SON_lags[4: 63,1:3], d=0)
AIC_CONF_SON <- cbind(fitCONF_SON1$aic,fitCONF_SON2$aic,fitCONF_SON3$aic)
colnames(AIC_CONF_SON)<-c("1 lag","2 lags", "3 lags")
```

```
AICs_SON<-rbind(AIC_IPV_SON,AIC_UNEMP_SON,AIC_REM_SON,AIC_GDP_SON,AIC_INPC_SUB_SON,AIC_INPC_E_SON,AIC_M
rownames(AICs_SON)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_SON
```

```
##              1 lag   2 lags    3 lags
## IPV       96.82556 96.33651  96.65188
## DESEMPLEO 95.94560 97.84652  99.84429
## REMESAS   97.53951 99.53862  98.68851
## PIB       97.54469 98.43594  97.39063
## INPC_SUB  96.05269 97.37815  99.26652
## INPC_E    97.54922 98.57986 100.51932
## M1        95.98391 97.25964  99.07618
## CONF      97.45605 98.28978 100.27590
```

```
# TAB
# IPV - TAB
IPV_TAB_v<-as.vector(IPV_TAB)
CV_TAB_v<-as.vector(CV_TAB)
IPV_TAB_v2<-cbind(IPV_TAB_v,CV_TAB_v)
colnames(IPV_TAB_v2)<-c("IPV_TAB","CV_TAB")
a<- lag(IPV_TAB_v,0)
x<- lag(IPV_TAB_v,1)
y<- lag(IPV_TAB_v,2)
z<- lag(IPV_TAB_v,3)
IPV_TAB_lags <- cbind(x,y,z)

fitIPV_TAB1 <- auto.arima(IPV_TAB_v2[4: 63,2], xreg=IPV_TAB_lags[4: 63,1], d=0)
fitIPV_TAB2 <- auto.arima(IPV_TAB_v2[4: 63,2], xreg=IPV_TAB_lags[4: 63,1:2], d=0)
fitIPV_TAB3 <- auto.arima(IPV_TAB_v2[4: 63,2], xreg=IPV_TAB_lags[4: 63,1:3], d=0)
AIC_IPV_TAB <- cbind(fitIPV_TAB1$aic,fitIPV_TAB2$aic,fitIPV_TAB3$aic)
colnames(AIC_IPV_TAB)<-c("1 lag","2 lags", "3 lags")
# UNEMP - TAB
UNEMP_TAB_v<-as.vector(UNEMP_TAB)
CV_TAB_v<-as.vector(CV_TAB)
UNEMP_TAB_v2<-cbind(UNEMP_TAB_v,CV_TAB_v)
colnames(UNEMP_TAB_v2)<-c("UNEMP_TAB","CV_TAB")
a<- lag(UNEMP_TAB_v,0)
x<- lag(UNEMP_TAB_v,1)
y<- lag(UNEMP_TAB_v,2)
z<- lag(UNEMP_TAB_v,3)
UNEMP_TAB_lags <- cbind(x,y,z)

fitUNEMP_TAB1 <- auto.arima(UNEMP_TAB_v2[4: 63,2], xreg=UNEMP_TAB_lags[4: 63,1], d=0)
fitUNEMP_TAB2 <- auto.arima(UNEMP_TAB_v2[4: 63,2], xreg=UNEMP_TAB_lags[4: 63,1:2], d=0)
fitUNEMP_TAB3 <- auto.arima(UNEMP_TAB_v2[4: 63,2], xreg=UNEMP_TAB_lags[4: 63,1:3], d=0)
AIC_UNEMP_TAB <- cbind(fitUNEMP_TAB1$aic,fitUNEMP_TAB2$aic,fitUNEMP_TAB3$aic)
colnames(AIC_UNEMP_TAB)<-c("1 lag","2 lags", "3 lags")
# REM - TAB
REM_TAB_v<-as.vector(REM_TAB)
CV_TAB_v<-as.vector(CV_TAB)
REM_TAB_v2<-cbind(REM_TAB_v,CV_TAB_v)
colnames(REM_TAB_v2)<-c("REM_TAB","CV_TAB")
a<- lag(REM_TAB_v,0)
```

```
x<- lag(REM_TAB_v,1)
y<- lag(REM_TAB_v,2)
z<- lag(REM_TAB_v,3)
REM_TAB_lags <- cbind(x,y,z)

fitREM_TAB1 <- auto.arima(REM_TAB_v2[4: 63,2], xreg=REM_TAB_lags[4: 63,1], d=0)
fitREM_TAB2 <- auto.arima(REM_TAB_v2[4: 63,2], xreg=REM_TAB_lags[4: 63,1:2], d=0)
fitREM_TAB3 <- auto.arima(REM_TAB_v2[4: 63,2], xreg=REM_TAB_lags[4: 63,1:3], d=0)
AIC_REM_TAB <- cbind(fitREM_TAB1$aic,fitREM_TAB2$aic,fitREM_TAB3$aic)
colnames(AIC_REM_TAB)<-c("1 lag","2 lags", "3 lags")
# GDP - TAB
GDP_TAB_v<-as.vector(GDP_TAB)
CV_TAB_v<-as.vector(CV_TAB)
GDP_TAB_v2<-cbind(GDP_TAB_v,CV_TAB_v)
colnames(GDP_TAB_v2)<-c("GDP_TAB","CV_TAB")
a<- lag(GDP_TAB_v,0)
x<- lag(GDP_TAB_v,1)
y<- lag(GDP_TAB_v,2)
z<- lag(GDP_TAB_v,3)
GDP_TAB_lags <- cbind(x,y,z)

fitGDP_TAB1 <- auto.arima(GDP_TAB_v2[4: 63,2], xreg=GDP_TAB_lags[4: 63,1], d=0)
fitGDP_TAB2 <- auto.arima(GDP_TAB_v2[4: 63,2], xreg=GDP_TAB_lags[4: 63,1:2], d=0)
fitGDP_TAB3 <- auto.arima(GDP_TAB_v2[4: 63,2], xreg=GDP_TAB_lags[4: 63,1:3], d=0)
AIC_GDP_TAB <- cbind(fitGDP_TAB1$aic,fitGDP_TAB2$aic,fitGDP_TAB3$aic)
colnames(AIC_GDP_TAB)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - TAB
INPC_SUB_TAB_v<-as.vector(INPC_SUB_TAB)
CV_TAB_v<-as.vector(CV_TAB)
INPC_SUB_TAB_v2<-cbind(INPC_SUB_TAB_v,CV_TAB_v)
colnames(INPC_SUB_TAB_v2)<-c("INPC_SUB_TAB","CV_TAB")
a<- lag(INPC_SUB_TAB_v,0)
x<- lag(INPC_SUB_TAB_v,1)
y<- lag(INPC_SUB_TAB_v,2)
z<- lag(INPC_SUB_TAB_v,3)
INPC_SUB_TAB_lags <- cbind(x,y,z)

fitINPC_SUB_TAB1 <- auto.arima(INPC_SUB_TAB_v2[4: 63,2], xreg=INPC_SUB_TAB_lags[4: 63,1], d=0)
fitINPC_SUB_TAB2 <- auto.arima(INPC_SUB_TAB_v2[4: 63,2], xreg=INPC_SUB_TAB_lags[4: 63,1:2], d=0)
fitINPC_SUB_TAB3 <- auto.arima(INPC_SUB_TAB_v2[4: 63,2], xreg=INPC_SUB_TAB_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_TAB <- cbind(fitINPC_SUB_TAB1$aic,fitINPC_SUB_TAB2$aic,fitINPC_SUB_TAB3$aic)
colnames(AIC_INPC_SUB_TAB)<-c("1 lag","2 lags", "3 lags")
# INPC_E - TAB
INPC_E_TAB_v<-as.vector(INPC_E_TAB)
CV_TAB_v<-as.vector(CV_TAB)
INPC_E_TAB_v2<-cbind(INPC_E_TAB_v,CV_TAB_v)
colnames(INPC_E_TAB_v2)<-c("INPC_E_TAB","CV_TAB")
a<- lag(INPC_E_TAB_v,0)
x<- lag(INPC_E_TAB_v,1)
y<- lag(INPC_E_TAB_v,2)
z<- lag(INPC_E_TAB_v,3)
INPC_E_TAB_lags <- cbind(x,y,z)
```

```
fitINPC_E_TAB1 <- auto.arima(INPC_E_TAB_v2[4: 63,2], xreg=INPC_E_TAB_lags[4: 63,1], d=0)
fitINPC_E_TAB2 <- auto.arima(INPC_E_TAB_v2[4: 63,2], xreg=INPC_E_TAB_lags[4: 63,1:2], d=0)
fitINPC_E_TAB3 <- auto.arima(INPC_E_TAB_v2[4: 63,2], xreg=INPC_E_TAB_lags[4: 63,1:3], d=0)
AIC_INPC_E_TAB <- cbind(fitINPC_E_TAB1$aic,fitINPC_E_TAB2$aic,fitINPC_E_TAB3$aic)
colnames(AIC_INPC_E_TAB)<-c("1 lag","2 lags", "3 lags")
# M1 - TAB
M1_TAB_v<-as.vector(M1_TAB)
CV_TAB_v<-as.vector(CV_TAB)
M1_TAB_v2<-cbind(M1_TAB_v,CV_TAB_v)
colnames(M1_TAB_v2)<-c("M1_TAB","CV_TAB")
a<- lag(M1_TAB_v,0)
x<- lag(M1_TAB_v,1)
y<- lag(M1_TAB_v,2)
z<- lag(M1_TAB_v,3)
M1_TAB_lags <- cbind(x,y,z)

fitM1_TAB1 <- auto.arima(M1_TAB_v2[4: 63,2], xreg=M1_TAB_lags[4: 63,1], d=0)
fitM1_TAB2 <- auto.arima(M1_TAB_v2[4: 63,2], xreg=M1_TAB_lags[4: 63,1:2], d=0)
fitM1_TAB3 <- auto.arima(M1_TAB_v2[4: 63,2], xreg=M1_TAB_lags[4: 63,1:3], d=0)
AIC_M1_TAB <- cbind(fitM1_TAB1$aic,fitM1_TAB2$aic,fitM1_TAB3$aic)
colnames(AIC_M1_TAB)<-c("1 lag","2 lags", "3 lags")
# CONF - TAB
CONF_TAB_v<-as.vector(CONF_TAB)
CV_TAB_v<-as.vector(CV_TAB)
CONF_TAB_v2<-cbind(CONF_TAB_v,CV_TAB_v)
colnames(CONF_TAB_v2)<-c("CONF_TAB","CV_TAB")
a<- lag(CONF_TAB_v,0)
x<- lag(CONF_TAB_v,1)
y<- lag(CONF_TAB_v,2)
z<- lag(CONF_TAB_v,3)
CONF_TAB_lags <- cbind(x,y,z)

fitCONF_TAB1 <- auto.arima(CONF_TAB_v2[4: 63,2], xreg=CONF_TAB_lags[4: 63,1], d=0)
fitCONF_TAB2 <- auto.arima(CONF_TAB_v2[4: 63,2], xreg=CONF_TAB_lags[4: 63,1:2], d=0)
fitCONF_TAB3 <- auto.arima(CONF_TAB_v2[4: 63,2], xreg=CONF_TAB_lags[4: 63,1:3], d=0)
AIC_CONF_TAB <- cbind(fitCONF_TAB1$aic,fitCONF_TAB2$aic,fitCONF_TAB3$aic)
colnames(AIC_CONF_TAB)<-c("1 lag","2 lags", "3 lags")

AICs_TAB<-rbind(AIC_IPV_TAB,AIC_UNEMP_TAB,AIC_REM_TAB,AIC_GDP_TAB,AIC_INPC_SUB_TAB,AIC_INPC_E_TAB,AIC_M
rownames(AICs_TAB)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_TAB
```

```
##              1 lag   2 lags    3 lags
## IPV       94.14803 95.70281  97.57123
## DESEMPLEO 95.98543 92.49420  92.73600
## REMESAS   96.27901 98.05077 100.04991
## PIB       96.34974 98.25717 100.21804
## INPC_SUB  94.65443 96.40217  97.21143
## INPC_E    95.84126 97.36133  99.11161
## M1        96.07722 97.20528  98.69242
## CONF      96.10524 97.59444  99.59368
```

```
# TAMPS
# IPV - TAMPS
IPV_TAMPS_v<-as.vector(IPV_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
IPV_TAMPS_v2<-cbind(IPV_TAMPS_v,CV_TAMPS_v)
colnames(IPV_TAMPS_v2)<-c("IPV_TAMPS","CV_TAMPS")
a<- lag(IPV_TAMPS_v,0)
x<- lag(IPV_TAMPS_v,1)
y<- lag(IPV_TAMPS_v,2)
z<- lag(IPV_TAMPS_v,3)
IPV_TAMPS_lags <- cbind(x,y,z)

fitIPV_TAMPS1 <- auto.arima(IPV_TAMPS_v2[4: 63,2], xreg=IPV_TAMPS_lags[4: 63,1], d=0)
fitIPV_TAMPS2 <- auto.arima(IPV_TAMPS_v2[4: 63,2], xreg=IPV_TAMPS_lags[4: 63,1:2], d=0)
fitIPV_TAMPS3 <- auto.arima(IPV_TAMPS_v2[4: 63,2], xreg=IPV_TAMPS_lags[4: 63,1:3], d=0)
AIC_IPV_TAMPS <- cbind(fitIPV_TAMPS1$aic,fitIPV_TAMPS2$aic,fitIPV_TAMPS3$aic)
colnames(AIC_IPV_TAMPS)<-c("1 lag","2 lags", "3 lags")
# UNEMP - TAMPS
UNEMP_TAMPS_v<-as.vector(UNEMP_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
UNEMP_TAMPS_v2<-cbind(UNEMP_TAMPS_v,CV_TAMPS_v)
colnames(UNEMP_TAMPS_v2)<-c("UNEMP_TAMPS","CV_TAMPS")
a<- lag(UNEMP_TAMPS_v,0)
x<- lag(UNEMP_TAMPS_v,1)
y<- lag(UNEMP_TAMPS_v,2)
z<- lag(UNEMP_TAMPS_v,3)
UNEMP_TAMPS_lags <- cbind(x,y,z)

fitUNEMP_TAMPS1 <- auto.arima(UNEMP_TAMPS_v2[4: 63,2], xreg=UNEMP_TAMPS_lags[4: 63,1], d=0)
fitUNEMP_TAMPS2 <- auto.arima(UNEMP_TAMPS_v2[4: 63,2], xreg=UNEMP_TAMPS_lags[4: 63,1:2], d=0)
fitUNEMP_TAMPS3 <- auto.arima(UNEMP_TAMPS_v2[4: 63,2], xreg=UNEMP_TAMPS_lags[4: 63,1:3], d=0)
AIC_UNEMP_TAMPS <- cbind(fitUNEMP_TAMPS1$aic,fitUNEMP_TAMPS2$aic,fitUNEMP_TAMPS3$aic)
colnames(AIC_UNEMP_TAMPS)<-c("1 lag","2 lags", "3 lags")
# REM - TAMPS
REM_TAMPS_v<-as.vector(REM_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
REM_TAMPS_v2<-cbind(REM_TAMPS_v,CV_TAMPS_v)
colnames(REM_TAMPS_v2)<-c("REM_TAMPS","CV_TAMPS")
a<- lag(REM_TAMPS_v,0)
x<- lag(REM_TAMPS_v,1)
y<- lag(REM_TAMPS_v,2)
z<- lag(REM_TAMPS_v,3)
REM_TAMPS_lags <- cbind(x,y,z)

fitREM_TAMPS1 <- auto.arima(REM_TAMPS_v2[4: 63,2], xreg=REM_TAMPS_lags[4: 63,1], d=0)
fitREM_TAMPS2 <- auto.arima(REM_TAMPS_v2[4: 63,2], xreg=REM_TAMPS_lags[4: 63,1:2], d=0)
fitREM_TAMPS3 <- auto.arima(REM_TAMPS_v2[4: 63,2], xreg=REM_TAMPS_lags[4: 63,1:3], d=0)
AIC_REM_TAMPS <- cbind(fitREM_TAMPS1$aic,fitREM_TAMPS2$aic,fitREM_TAMPS3$aic)
colnames(AIC_REM_TAMPS)<-c("1 lag","2 lags", "3 lags")
# GDP - TAMPS
GDP_TAMPS_v<-as.vector(GDP_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
GDP_TAMPS_v2<-cbind(GDP_TAMPS_v,CV_TAMPS_v)
```

```
colnames(GDP_TAMPS_v2)<-c("GDP_TAMPS","CV_TAMPS")
a<- lag(GDP_TAMPS_v,0)
x<- lag(GDP_TAMPS_v,1)
y<- lag(GDP_TAMPS_v,2)
z<- lag(GDP_TAMPS_v,3)
GDP_TAMPS_lags <- cbind(x,y,z)

fitGDP_TAMPS1 <- auto.arima(GDP_TAMPS_v2[4: 63,2], xreg=GDP_TAMPS_lags[4: 63,1], d=0)
fitGDP_TAMPS2 <- auto.arima(GDP_TAMPS_v2[4: 63,2], xreg=GDP_TAMPS_lags[4: 63,1:2], d=0)
fitGDP_TAMPS3 <- auto.arima(GDP_TAMPS_v2[4: 63,2], xreg=GDP_TAMPS_lags[4: 63,1:3], d=0)
AIC_GDP_TAMPS <- cbind(fitGDP_TAMPS1$aic,fitGDP_TAMPS2$aic,fitGDP_TAMPS3$aic)
colnames(AIC_GDP_TAMPS)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - TAMPS
INPC_SUB_TAMPS_v<-as.vector(INPC_SUB_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
INPC_SUB_TAMPS_v2<-cbind(INPC_SUB_TAMPS_v,CV_TAMPS_v)
colnames(INPC_SUB_TAMPS_v2)<-c("INPC_SUB_TAMPS","CV_TAMPS")
a<- lag(INPC_SUB_TAMPS_v,0)
x<- lag(INPC_SUB_TAMPS_v,1)
y<- lag(INPC_SUB_TAMPS_v,2)
z<- lag(INPC_SUB_TAMPS_v,3)
INPC_SUB_TAMPS_lags <- cbind(x,y,z)

fitINPC_SUB_TAMPS1 <- auto.arima(INPC_SUB_TAMPS_v2[4: 63,2], xreg=INPC_SUB_TAMPS_lags[4: 63,1], d=0)
fitINPC_SUB_TAMPS2 <- auto.arima(INPC_SUB_TAMPS_v2[4: 63,2], xreg=INPC_SUB_TAMPS_lags[4: 63,1:2], d=0)
fitINPC_SUB_TAMPS3 <- auto.arima(INPC_SUB_TAMPS_v2[4: 63,2], xreg=INPC_SUB_TAMPS_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_TAMPS <- cbind(fitINPC_SUB_TAMPS1$aic,fitINPC_SUB_TAMPS2$aic,fitINPC_SUB_TAMPS3$aic)
colnames(AIC_INPC_SUB_TAMPS)<-c("1 lag","2 lags", "3 lags")
# INPC_E - TAMPS
INPC_E_TAMPS_v<-as.vector(INPC_E_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
INPC_E_TAMPS_v2<-cbind(INPC_E_TAMPS_v,CV_TAMPS_v)
colnames(INPC_E_TAMPS_v2)<-c("INPC_E_TAMPS","CV_TAMPS")
a<- lag(INPC_E_TAMPS_v,0)
x<- lag(INPC_E_TAMPS_v,1)
y<- lag(INPC_E_TAMPS_v,2)
z<- lag(INPC_E_TAMPS_v,3)
INPC_E_TAMPS_lags <- cbind(x,y,z)

fitINPC_E_TAMPS1 <- auto.arima(INPC_E_TAMPS_v2[4: 63,2], xreg=INPC_E_TAMPS_lags[4: 63,1], d=0)
fitINPC_E_TAMPS2 <- auto.arima(INPC_E_TAMPS_v2[4: 63,2], xreg=INPC_E_TAMPS_lags[4: 63,1:2], d=0)
fitINPC_E_TAMPS3 <- auto.arima(INPC_E_TAMPS_v2[4: 63,2], xreg=INPC_E_TAMPS_lags[4: 63,1:3], d=0)
AIC_INPC_E_TAMPS <- cbind(fitINPC_E_TAMPS1$aic,fitINPC_E_TAMPS2$aic,fitINPC_E_TAMPS3$aic)
colnames(AIC_INPC_E_TAMPS)<-c("1 lag","2 lags", "3 lags")
# M1 - TAMPS
M1_TAMPS_v<-as.vector(M1_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
M1_TAMPS_v2<-cbind(M1_TAMPS_v,CV_TAMPS_v)
colnames(M1_TAMPS_v2)<-c("M1_TAMPS","CV_TAMPS")
a<- lag(M1_TAMPS_v,0)
x<- lag(M1_TAMPS_v,1)
y<- lag(M1_TAMPS_v,2)
z<- lag(M1_TAMPS_v,3)
```

```
M1_TAMPS_lags <- cbind(x,y,z)

fitM1_TAMPS1 <- auto.arima(M1_TAMPS_v2[4: 63,2], xreg=M1_TAMPS_lags[4: 63,1], d=0)
fitM1_TAMPS2 <- auto.arima(M1_TAMPS_v2[4: 63,2], xreg=M1_TAMPS_lags[4: 63,1:2], d=0)
fitM1_TAMPS3 <- auto.arima(M1_TAMPS_v2[4: 63,2], xreg=M1_TAMPS_lags[4: 63,1:3], d=0)
AIC_M1_TAMPS <- cbind(fitM1_TAMPS1$aic,fitM1_TAMPS2$aic,fitM1_TAMPS3$aic)
colnames(AIC_M1_TAMPS)<-c("1 lag","2 lags", "3 lags")
# CONF - TAMPS
CONF_TAMPS_v<-as.vector(CONF_TAMPS)
CV_TAMPS_v<-as.vector(CV_TAMPS)
CONF_TAMPS_v2<-cbind(CONF_TAMPS_v,CV_TAMPS_v)
colnames(CONF_TAMPS_v2)<-c("CONF_TAMPS","CV_TAMPS")
a<- lag(CONF_TAMPS_v,0)
x<- lag(CONF_TAMPS_v,1)
y<- lag(CONF_TAMPS_v,2)
z<- lag(CONF_TAMPS_v,3)
CONF_TAMPS_lags <- cbind(x,y,z)

fitCONF_TAMPS1 <- auto.arima(CONF_TAMPS_v2[4: 63,2], xreg=CONF_TAMPS_lags[4: 63,1], d=0)
fitCONF_TAMPS2 <- auto.arima(CONF_TAMPS_v2[4: 63,2], xreg=CONF_TAMPS_lags[4: 63,1:2], d=0)
fitCONF_TAMPS3 <- auto.arima(CONF_TAMPS_v2[4: 63,2], xreg=CONF_TAMPS_lags[4: 63,1:3], d=0)
AIC_CONF_TAMPS <- cbind(fitCONF_TAMPS1$aic,fitCONF_TAMPS2$aic,fitCONF_TAMPS3$aic)
colnames(AIC_CONF_TAMPS)<-c("1 lag","2 lags", "3 lags")

AICs_TAMPS<-rbind(AIC_IPV_TAMPS,AIC_UNEMP_TAMPS,AIC_REM_TAMPS,AIC_GDP_TAMPS,AIC_INPC_SUB_TAMPS,AIC_INPC
rownames(AICs_TAMPS)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_TAMPS
```

```
##              1 lag   2 lags   3 lags
## IPV       59.09829 59.16717 62.38631
## DESEMPLEO 57.16212 60.03119 61.84065
## REMESAS   59.03875 57.39463 61.27302
## PIB       58.94440 55.38742 56.83640
## INPC_SUB  57.97156 57.98736 61.79692
## INPC_E    58.82370 60.77799 62.61469
## M1        58.37847 60.27630 62.28930
## CONF      56.92871 56.85983 60.57019
```

```
# TLAX
# IPV - TLAX
IPV_TLAX_v<-as.vector(IPV_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
IPV_TLAX_v2<-cbind(IPV_TLAX_v,CV_TLAX_v)
colnames(IPV_TLAX_v2)<-c("IPV_TLAX","CV_TLAX")
a<- lag(IPV_TLAX_v,0)
x<- lag(IPV_TLAX_v,1)
y<- lag(IPV_TLAX_v,2)
z<- lag(IPV_TLAX_v,3)
IPV_TLAX_lags <- cbind(x,y,z)

fitIPV_TLAX1 <- auto.arima(IPV_TLAX_v2[4: 63,2], xreg=IPV_TLAX_lags[4: 63,1], d=0)
fitIPV_TLAX2 <- auto.arima(IPV_TLAX_v2[4: 63,2], xreg=IPV_TLAX_lags[4: 63,1:2], d=0)
fitIPV_TLAX3 <- auto.arima(IPV_TLAX_v2[4: 63,2], xreg=IPV_TLAX_lags[4: 63,1:3], d=0)
```

```
AIC_IPV_TLAX <- cbind(fitIPV_TLAX1$aic,fitIPV_TLAX2$aic,fitIPV_TLAX3$aic)
colnames(AIC_IPV_TLAX)<-c("1 lag","2 lags", "3 lags")
# UNEMP - TLAX
UNEMP_TLAX_v<-as.vector(UNEMP_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
UNEMP_TLAX_v2<-cbind(UNEMP_TLAX_v,CV_TLAX_v)
colnames(UNEMP_TLAX_v2)<-c("UNEMP_TLAX","CV_TLAX")
a<- lag(UNEMP_TLAX_v,0)
x<- lag(UNEMP_TLAX_v,1)
y<- lag(UNEMP_TLAX_v,2)
z<- lag(UNEMP_TLAX_v,3)
UNEMP_TLAX_lags <- cbind(x,y,z)

fitUNEMP_TLAX1 <- auto.arima(UNEMP_TLAX_v2[4: 63,2], xreg=UNEMP_TLAX_lags[4: 63,1], d=0)
fitUNEMP_TLAX2 <- auto.arima(UNEMP_TLAX_v2[4: 63,2], xreg=UNEMP_TLAX_lags[4: 63,1:2], d=0)
fitUNEMP_TLAX3 <- auto.arima(UNEMP_TLAX_v2[4: 63,2], xreg=UNEMP_TLAX_lags[4: 63,1:3], d=0)
AIC_UNEMP_TLAX <- cbind(fitUNEMP_TLAX1$aic,fitUNEMP_TLAX2$aic,fitUNEMP_TLAX3$aic)
colnames(AIC_UNEMP_TLAX)<-c("1 lag","2 lags", "3 lags")
# REM - TLAX
REM_TLAX_v<-as.vector(REM_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
REM_TLAX_v2<-cbind(REM_TLAX_v,CV_TLAX_v)
colnames(REM_TLAX_v2)<-c("REM_TLAX","CV_TLAX")
a<- lag(REM_TLAX_v,0)
x<- lag(REM_TLAX_v,1)
y<- lag(REM_TLAX_v,2)
z<- lag(REM_TLAX_v,3)
REM_TLAX_lags <- cbind(x,y,z)

fitREM_TLAX1 <- auto.arima(REM_TLAX_v2[4: 63,2], xreg=REM_TLAX_lags[4: 63,1], d=0)
fitREM_TLAX2 <- auto.arima(REM_TLAX_v2[4: 63,2], xreg=REM_TLAX_lags[4: 63,1:2], d=0)
fitREM_TLAX3 <- auto.arima(REM_TLAX_v2[4: 63,2], xreg=REM_TLAX_lags[4: 63,1:3], d=0)
AIC_REM_TLAX <- cbind(fitREM_TLAX1$aic,fitREM_TLAX2$aic,fitREM_TLAX3$aic)
colnames(AIC_REM_TLAX)<-c("1 lag","2 lags", "3 lags")
# GDP - TLAX
GDP_TLAX_v<-as.vector(GDP_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
GDP_TLAX_v2<-cbind(GDP_TLAX_v,CV_TLAX_v)
colnames(GDP_TLAX_v2)<-c("GDP_TLAX","CV_TLAX")
a<- lag(GDP_TLAX_v,0)
x<- lag(GDP_TLAX_v,1)
y<- lag(GDP_TLAX_v,2)
z<- lag(GDP_TLAX_v,3)
GDP_TLAX_lags <- cbind(x,y,z)

fitGDP_TLAX1 <- auto.arima(GDP_TLAX_v2[4: 63,2], xreg=GDP_TLAX_lags[4: 63,1], d=0)
fitGDP_TLAX2 <- auto.arima(GDP_TLAX_v2[4: 63,2], xreg=GDP_TLAX_lags[4: 63,1:2], d=0)
fitGDP_TLAX3 <- auto.arima(GDP_TLAX_v2[4: 63,2], xreg=GDP_TLAX_lags[4: 63,1:3], d=0)
AIC_GDP_TLAX <- cbind(fitGDP_TLAX1$aic,fitGDP_TLAX2$aic,fitGDP_TLAX3$aic)
colnames(AIC_GDP_TLAX)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - TLAX
INPC_SUB_TLAX_v<-as.vector(INPC_SUB_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
```

```
INPC_SUB_TLAX_v2<-cbind(INPC_SUB_TLAX_v,CV_TLAX_v)
colnames(INPC_SUB_TLAX_v2)<-c("INPC_SUB_TLAX","CV_TLAX")
a<- lag(INPC_SUB_TLAX_v,0)
x<- lag(INPC_SUB_TLAX_v,1)
y<- lag(INPC_SUB_TLAX_v,2)
z<- lag(INPC_SUB_TLAX_v,3)
INPC_SUB_TLAX_lags <- cbind(x,y,z)

fitINPC_SUB_TLAX1 <- auto.arima(INPC_SUB_TLAX_v2[4: 63,2], xreg=INPC_SUB_TLAX_lags[4: 63,1], d=0)
fitINPC_SUB_TLAX2 <- auto.arima(INPC_SUB_TLAX_v2[4: 63,2], xreg=INPC_SUB_TLAX_lags[4: 63,1:2], d=0)
fitINPC_SUB_TLAX3 <- auto.arima(INPC_SUB_TLAX_v2[4: 63,2], xreg=INPC_SUB_TLAX_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_TLAX <- cbind(fitINPC_SUB_TLAX1$aic,fitINPC_SUB_TLAX2$aic,fitINPC_SUB_TLAX3$aic)
colnames(AIC_INPC_SUB_TLAX)<-c("1 lag","2 lags", "3 lags")
# INPC_E - TLAX
INPC_E_TLAX_v<-as.vector(INPC_E_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
INPC_E_TLAX_v2<-cbind(INPC_E_TLAX_v,CV_TLAX_v)
colnames(INPC_E_TLAX_v2)<-c("INPC_E_TLAX","CV_TLAX")
a<- lag(INPC_E_TLAX_v,0)
x<- lag(INPC_E_TLAX_v,1)
y<- lag(INPC_E_TLAX_v,2)
z<- lag(INPC_E_TLAX_v,3)
INPC_E_TLAX_lags <- cbind(x,y,z)

fitINPC_E_TLAX1 <- auto.arima(INPC_E_TLAX_v2[4: 63,2], xreg=INPC_E_TLAX_lags[4: 63,1], d=0)
fitINPC_E_TLAX2 <- auto.arima(INPC_E_TLAX_v2[4: 63,2], xreg=INPC_E_TLAX_lags[4: 63,1:2], d=0)
fitINPC_E_TLAX3 <- auto.arima(INPC_E_TLAX_v2[4: 63,2], xreg=INPC_E_TLAX_lags[4: 63,1:3], d=0)
AIC_INPC_E_TLAX <- cbind(fitINPC_E_TLAX1$aic,fitINPC_E_TLAX2$aic,fitINPC_E_TLAX3$aic)
colnames(AIC_INPC_E_TLAX)<-c("1 lag","2 lags", "3 lags")
# M1 - TLAX
M1_TLAX_v<-as.vector(M1_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
M1_TLAX_v2<-cbind(M1_TLAX_v,CV_TLAX_v)
colnames(M1_TLAX_v2)<-c("M1_TLAX","CV_TLAX")
a<- lag(M1_TLAX_v,0)
x<- lag(M1_TLAX_v,1)
y<- lag(M1_TLAX_v,2)
z<- lag(M1_TLAX_v,3)
M1_TLAX_lags <- cbind(x,y,z)

fitM1_TLAX1 <- auto.arima(M1_TLAX_v2[4: 63,2], xreg=M1_TLAX_lags[4: 63,1], d=0)
fitM1_TLAX2 <- auto.arima(M1_TLAX_v2[4: 63,2], xreg=M1_TLAX_lags[4: 63,1:2], d=0)
fitM1_TLAX3 <- auto.arima(M1_TLAX_v2[4: 63,2], xreg=M1_TLAX_lags[4: 63,1:3], d=0)
AIC_M1_TLAX <- cbind(fitM1_TLAX1$aic,fitM1_TLAX2$aic,fitM1_TLAX3$aic)
colnames(AIC_M1_TLAX)<-c("1 lag","2 lags", "3 lags")
# CONF - TLAX
CONF_TLAX_v<-as.vector(CONF_TLAX)
CV_TLAX_v<-as.vector(CV_TLAX)
CONF_TLAX_v2<-cbind(CONF_TLAX_v,CV_TLAX_v)
colnames(CONF_TLAX_v2)<-c("CONF_TLAX","CV_TLAX")
a<- lag(CONF_TLAX_v,0)
x<- lag(CONF_TLAX_v,1)
y<- lag(CONF_TLAX_v,2)
```

```
z<- lag(CONF_TLAX_v,3)
CONF_TLAX_lags <- cbind(x,y,z)

fitCONF_TLAX1 <- auto.arima(CONF_TLAX_v2[4: 63,2], xreg=CONF_TLAX_lags[4: 63,1], d=0)
fitCONF_TLAX2 <- auto.arima(CONF_TLAX_v2[4: 63,2], xreg=CONF_TLAX_lags[4: 63,1:2], d=0)
fitCONF_TLAX3 <- auto.arima(CONF_TLAX_v2[4: 63,2], xreg=CONF_TLAX_lags[4: 63,1:3], d=0)
AIC_CONF_TLAX <- cbind(fitCONF_TLAX1$aic,fitCONF_TLAX2$aic,fitCONF_TLAX3$aic)
colnames(AIC_CONF_TLAX)<-c("1 lag","2 lags", "3 lags")

AICs_TLAX<-rbind(AIC_IPV_TLAX,AIC_UNEMP_TLAX,AIC_REM_TLAX,AIC_GDP_TLAX,AIC_INPC_SUB_TLAX,AIC_INPC_E_TLA
rownames(AICs_TLAX)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_TLAX
```

```
##              1 lag   2 lags   3 lags
## IPV       149.6126 144.4834 146.4756
## DESEMPLEO 148.5233 150.3755 152.2453
## REMESAS   149.3571 150.9620 152.7892
## PIB       150.4704 151.9604 152.8678
## INPC_SUB  150.0184 151.8883 153.7269
## INPC_E    149.7513 151.5878 153.2633
## M1        150.2741 150.7180 152.4859
## CONF      150.2390 152.1319 154.0671
```

```
# VER
# IPV - VER
IPV_VER_v<-as.vector(IPV_VER)
CV_VER_v<-as.vector(CV_VER)
IPV_VER_v2<-cbind(IPV_VER_v,CV_VER_v)
colnames(IPV_VER_v2)<-c("IPV_VER","CV_VER")
a<- lag(IPV_VER_v,0)
x<- lag(IPV_VER_v,1)
y<- lag(IPV_VER_v,2)
z<- lag(IPV_VER_v,3)
IPV_VER_lags <- cbind(x,y,z)

fitIPV_VER1 <- auto.arima(IPV_VER_v2[4: 63,2], xreg=IPV_VER_lags[4: 63,1], d=0)
fitIPV_VER2 <- auto.arima(IPV_VER_v2[4: 63,2], xreg=IPV_VER_lags[4: 63,1:2], d=0)
fitIPV_VER3 <- auto.arima(IPV_VER_v2[4: 63,2], xreg=IPV_VER_lags[4: 63,1:3], d=0)
AIC_IPV_VER <- cbind(fitIPV_VER1$aic,fitIPV_VER2$aic,fitIPV_VER3$aic)
colnames(AIC_IPV_VER)<-c("1 lag","2 lags", "3 lags")
# UNEMP - VER
UNEMP_VER_v<-as.vector(UNEMP_VER)
CV_VER_v<-as.vector(CV_VER)
UNEMP_VER_v2<-cbind(UNEMP_VER_v,CV_VER_v)
colnames(UNEMP_VER_v2)<-c("UNEMP_VER","CV_VER")
a<- lag(UNEMP_VER_v,0)
x<- lag(UNEMP_VER_v,1)
y<- lag(UNEMP_VER_v,2)
z<- lag(UNEMP_VER_v,3)
UNEMP_VER_lags <- cbind(x,y,z)

fitUNEMP_VER1 <- auto.arima(UNEMP_VER_v2[4: 63,2], xreg=UNEMP_VER_lags[4: 63,1], d=0)
fitUNEMP_VER2 <- auto.arima(UNEMP_VER_v2[4: 63,2], xreg=UNEMP_VER_lags[4: 63,1:2], d=0)
```

```
fitUNEMP_VER3 <- auto.arima(UNEMP_VER_v2[4: 63,2], xreg=UNEMP_VER_lags[4: 63,1:3], d=0)
AIC_UNEMP_VER <- cbind(fitUNEMP_VER1$aic,fitUNEMP_VER2$aic,fitUNEMP_VER3$aic)
colnames(AIC_UNEMP_VER)<-c("1 lag","2 lags", "3 lags")
# REM - VER
REM_VER_v<-as.vector(REM_VER)
CV_VER_v<-as.vector(CV_VER)
REM_VER_v2<-cbind(REM_VER_v,CV_VER_v)
colnames(REM_VER_v2)<-c("REM_VER","CV_VER")
a<- lag(REM_VER_v,0)
x<- lag(REM_VER_v,1)
y<- lag(REM_VER_v,2)
z<- lag(REM_VER_v,3)
REM_VER_lags <- cbind(x,y,z)

fitREM_VER1 <- auto.arima(REM_VER_v2[4: 63,2], xreg=REM_VER_lags[4: 63,1], d=0)
fitREM_VER2 <- auto.arima(REM_VER_v2[4: 63,2], xreg=REM_VER_lags[4: 63,1:2], d=0)
fitREM_VER3 <- auto.arima(REM_VER_v2[4: 63,2], xreg=REM_VER_lags[4: 63,1:3], d=0)
AIC_REM_VER <- cbind(fitREM_VER1$aic,fitREM_VER2$aic,fitREM_VER3$aic)
colnames(AIC_REM_VER)<-c("1 lag","2 lags", "3 lags")
# GDP - VER
GDP_VER_v<-as.vector(GDP_VER)
CV_VER_v<-as.vector(CV_VER)
GDP_VER_v2<-cbind(GDP_VER_v,CV_VER_v)
colnames(GDP_VER_v2)<-c("GDP_VER","CV_VER")
a<- lag(GDP_VER_v,0)
x<- lag(GDP_VER_v,1)
y<- lag(GDP_VER_v,2)
z<- lag(GDP_VER_v,3)
GDP_VER_lags <- cbind(x,y,z)

fitGDP_VER1 <- auto.arima(GDP_VER_v2[4: 63,2], xreg=GDP_VER_lags[4: 63,1], d=0)
fitGDP_VER2 <- auto.arima(GDP_VER_v2[4: 63,2], xreg=GDP_VER_lags[4: 63,1:2], d=0)
fitGDP_VER3 <- auto.arima(GDP_VER_v2[4: 63,2], xreg=GDP_VER_lags[4: 63,1:3], d=0)
AIC_GDP_VER <- cbind(fitGDP_VER1$aic,fitGDP_VER2$aic,fitGDP_VER3$aic)
colnames(AIC_GDP_VER)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - VER
INPC_SUB_VER_v<-as.vector(INPC_SUB_VER)
CV_VER_v<-as.vector(CV_VER)
INPC_SUB_VER_v2<-cbind(INPC_SUB_VER_v,CV_VER_v)
colnames(INPC_SUB_VER_v2)<-c("INPC_SUB_VER","CV_VER")
a<- lag(INPC_SUB_VER_v,0)
x<- lag(INPC_SUB_VER_v,1)
y<- lag(INPC_SUB_VER_v,2)
z<- lag(INPC_SUB_VER_v,3)
INPC_SUB_VER_lags <- cbind(x,y,z)

fitINPC_SUB_VER1 <- auto.arima(INPC_SUB_VER_v2[4: 63,2], xreg=INPC_SUB_VER_lags[4: 63,1], d=0)
fitINPC_SUB_VER2 <- auto.arima(INPC_SUB_VER_v2[4: 63,2], xreg=INPC_SUB_VER_lags[4: 63,1:2], d=0)
fitINPC_SUB_VER3 <- auto.arima(INPC_SUB_VER_v2[4: 63,2], xreg=INPC_SUB_VER_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_VER <- cbind(fitINPC_SUB_VER1$aic,fitINPC_SUB_VER2$aic,fitINPC_SUB_VER3$aic)
colnames(AIC_INPC_SUB_VER)<-c("1 lag","2 lags", "3 lags")
# INPC_E - VER
INPC_E_VER_v<-as.vector(INPC_E_VER)
```

```
CV_VER_v<-as.vector(CV_VER)
INPC_E_VER_v2<-cbind(INPC_E_VER_v,CV_VER_v)
colnames(INPC_E_VER_v2)<-c("INPC_E_VER","CV_VER")
a<- lag(INPC_E_VER_v,0)
x<- lag(INPC_E_VER_v,1)
y<- lag(INPC_E_VER_v,2)
z<- lag(INPC_E_VER_v,3)
INPC_E_VER_lags <- cbind(x,y,z)

fitINPC_E_VER1 <- auto.arima(INPC_E_VER_v2[4: 63,2], xreg=INPC_E_VER_lags[4: 63,1], d=0)
fitINPC_E_VER2 <- auto.arima(INPC_E_VER_v2[4: 63,2], xreg=INPC_E_VER_lags[4: 63,1:2], d=0)
fitINPC_E_VER3 <- auto.arima(INPC_E_VER_v2[4: 63,2], xreg=INPC_E_VER_lags[4: 63,1:3], d=0)
AIC_INPC_E_VER <- cbind(fitINPC_E_VER1$aic,fitINPC_E_VER2$aic,fitINPC_E_VER3$aic)
colnames(AIC_INPC_E_VER)<-c("1 lag","2 lags", "3 lags")
# M1 - VER
M1_VER_v<-as.vector(M1_VER)
CV_VER_v<-as.vector(CV_VER)
M1_VER_v2<-cbind(M1_VER_v,CV_VER_v)
colnames(M1_VER_v2)<-c("M1_VER","CV_VER")
a<- lag(M1_VER_v,0)
x<- lag(M1_VER_v,1)
y<- lag(M1_VER_v,2)
z<- lag(M1_VER_v,3)
M1_VER_lags <- cbind(x,y,z)

fitM1_VER1 <- auto.arima(M1_VER_v2[4: 63,2], xreg=M1_VER_lags[4: 63,1], d=0)
fitM1_VER2 <- auto.arima(M1_VER_v2[4: 63,2], xreg=M1_VER_lags[4: 63,1:2], d=0)
fitM1_VER3 <- auto.arima(M1_VER_v2[4: 63,2], xreg=M1_VER_lags[4: 63,1:3], d=0)
AIC_M1_VER <- cbind(fitM1_VER1$aic,fitM1_VER2$aic,fitM1_VER3$aic)
colnames(AIC_M1_VER)<-c("1 lag","2 lags", "3 lags")
# CONF - VER
CONF_VER_v<-as.vector(CONF_VER)
CV_VER_v<-as.vector(CV_VER)
CONF_VER_v2<-cbind(CONF_VER_v,CV_VER_v)
colnames(CONF_VER_v2)<-c("CONF_VER","CV_VER")
a<- lag(CONF_VER_v,0)
x<- lag(CONF_VER_v,1)
y<- lag(CONF_VER_v,2)
z<- lag(CONF_VER_v,3)
CONF_VER_lags <- cbind(x,y,z)

fitCONF_VER1 <- auto.arima(CONF_VER_v2[4: 63,2], xreg=CONF_VER_lags[4: 63,1], d=0)
fitCONF_VER2 <- auto.arima(CONF_VER_v2[4: 63,2], xreg=CONF_VER_lags[4: 63,1:2], d=0)
fitCONF_VER3 <- auto.arima(CONF_VER_v2[4: 63,2], xreg=CONF_VER_lags[4: 63,1:3], d=0)
AIC_CONF_VER <- cbind(fitCONF_VER1$aic,fitCONF_VER2$aic,fitCONF_VER3$aic)
colnames(AIC_CONF_VER)<-c("1 lag","2 lags", "3 lags")

AICs_VER<-rbind(AIC_IPV_VER,AIC_UNEMP_VER,AIC_REM_VER,AIC_GDP_VER,AIC_INPC_SUB_VER,AIC_INPC_E_VER,AIC_M
rownames(AICs_VER)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_VER
```

```
##             1 lag   2 lags   3 lags
## IPV      113.8375 114.1962 116.1665
```

```
## DESEMPLEO 111.9867 113.9706 115.3440
## REMESAS   114.4478 116.3440 114.9971
## PIB       107.5323 109.3041 110.2646
## INPC_SUB  110.9470 111.6888 112.9252
## INPC_E    114.5478 114.6725 116.5720
## M1        112.5987 113.4046 115.0838
## CONF      114.4984 115.4844 117.4690
```

```
# YUC
# IPV - YUC
IPV_YUC_v<-as.vector(IPV_YUC)
CV_YUC_v<-as.vector(CV_YUC)
IPV_YUC_v2<-cbind(IPV_YUC_v,CV_YUC_v)
colnames(IPV_YUC_v2)<-c("IPV_YUC","CV_YUC")
a<- lag(IPV_YUC_v,0)
x<- lag(IPV_YUC_v,1)
y<- lag(IPV_YUC_v,2)
z<- lag(IPV_YUC_v,3)
IPV_YUC_lags <- cbind(x,y,z)

fitIPV_YUC1 <- auto.arima(IPV_YUC_v2[4: 63,2], xreg=IPV_YUC_lags[4: 63,1], d=0)
fitIPV_YUC2 <- auto.arima(IPV_YUC_v2[4: 63,2], xreg=IPV_YUC_lags[4: 63,1:2], d=0)
fitIPV_YUC3 <- auto.arima(IPV_YUC_v2[4: 63,2], xreg=IPV_YUC_lags[4: 63,1:3], d=0)
AIC_IPV_YUC <- cbind(fitIPV_YUC1$aic,fitIPV_YUC2$aic,fitIPV_YUC3$aic)
colnames(AIC_IPV_YUC)<-c("1 lag","2 lags", "3 lags")
# UNEMP - YUC
UNEMP_YUC_v<-as.vector(UNEMP_YUC)
CV_YUC_v<-as.vector(CV_YUC)
UNEMP_YUC_v2<-cbind(UNEMP_YUC_v,CV_YUC_v)
colnames(UNEMP_YUC_v2)<-c("UNEMP_YUC","CV_YUC")
a<- lag(UNEMP_YUC_v,0)
x<- lag(UNEMP_YUC_v,1)
y<- lag(UNEMP_YUC_v,2)
z<- lag(UNEMP_YUC_v,3)
UNEMP_YUC_lags <- cbind(x,y,z)

fitUNEMP_YUC1 <- auto.arima(UNEMP_YUC_v2[4: 63,2], xreg=UNEMP_YUC_lags[4: 63,1], d=0)
fitUNEMP_YUC2 <- auto.arima(UNEMP_YUC_v2[4: 63,2], xreg=UNEMP_YUC_lags[4: 63,1:2], d=0)
fitUNEMP_YUC3 <- auto.arima(UNEMP_YUC_v2[4: 63,2], xreg=UNEMP_YUC_lags[4: 63,1:3], d=0)
AIC_UNEMP_YUC <- cbind(fitUNEMP_YUC1$aic,fitUNEMP_YUC2$aic,fitUNEMP_YUC3$aic)
colnames(AIC_UNEMP_YUC)<-c("1 lag","2 lags", "3 lags")
# REM - YUC
REM_YUC_v<-as.vector(REM_YUC)
CV_YUC_v<-as.vector(CV_YUC)
REM_YUC_v2<-cbind(REM_YUC_v,CV_YUC_v)
colnames(REM_YUC_v2)<-c("REM_YUC","CV_YUC")
a<- lag(REM_YUC_v,0)
x<- lag(REM_YUC_v,1)
y<- lag(REM_YUC_v,2)
z<- lag(REM_YUC_v,3)
REM_YUC_lags <- cbind(x,y,z)

fitREM_YUC1 <- auto.arima(REM_YUC_v2[4: 63,2], xreg=REM_YUC_lags[4: 63,1], d=0)
fitREM_YUC2 <- auto.arima(REM_YUC_v2[4: 63,2], xreg=REM_YUC_lags[4: 63,1:2], d=0)
```

```
fitREM_YUC3 <- auto.arima(REM_YUC_v2[4: 63,2], xreg=REM_YUC_lags[4: 63,1:3], d=0)
AIC_REM_YUC <- cbind(fitREM_YUC1$aic,fitREM_YUC2$aic,fitREM_YUC3$aic)
colnames(AIC_REM_YUC)<-c("1 lag","2 lags", "3 lags")
# GDP - YUC
GDP_YUC_v<-as.vector(GDP_YUC)
CV_YUC_v<-as.vector(CV_YUC)
GDP_YUC_v2<-cbind(GDP_YUC_v,CV_YUC_v)
colnames(GDP_YUC_v2)<-c("GDP_YUC","CV_YUC")
a<- lag(GDP_YUC_v,0)
x<- lag(GDP_YUC_v,1)
y<- lag(GDP_YUC_v,2)
z<- lag(GDP_YUC_v,3)
GDP_YUC_lags <- cbind(x,y,z)

fitGDP_YUC1 <- auto.arima(GDP_YUC_v2[4: 63,2], xreg=GDP_YUC_lags[4: 63,1], d=0)
fitGDP_YUC2 <- auto.arima(GDP_YUC_v2[4: 63,2], xreg=GDP_YUC_lags[4: 63,1:2], d=0)
fitGDP_YUC3 <- auto.arima(GDP_YUC_v2[4: 63,2], xreg=GDP_YUC_lags[4: 63,1:3], d=0)
AIC_GDP_YUC <- cbind(fitGDP_YUC1$aic,fitGDP_YUC2$aic,fitGDP_YUC3$aic)
colnames(AIC_GDP_YUC)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - YUC
INPC_SUB_YUC_v<-as.vector(INPC_SUB_YUC)
CV_YUC_v<-as.vector(CV_YUC)
INPC_SUB_YUC_v2<-cbind(INPC_SUB_YUC_v,CV_YUC_v)
colnames(INPC_SUB_YUC_v2)<-c("INPC_SUB_YUC","CV_YUC")
a<- lag(INPC_SUB_YUC_v,0)
x<- lag(INPC_SUB_YUC_v,1)
y<- lag(INPC_SUB_YUC_v,2)
z<- lag(INPC_SUB_YUC_v,3)
INPC_SUB_YUC_lags <- cbind(x,y,z)

fitINPC_SUB_YUC1 <- auto.arima(INPC_SUB_YUC_v2[4: 63,2], xreg=INPC_SUB_YUC_lags[4: 63,1], d=0)
fitINPC_SUB_YUC2 <- auto.arima(INPC_SUB_YUC_v2[4: 63,2], xreg=INPC_SUB_YUC_lags[4: 63,1:2], d=0)
fitINPC_SUB_YUC3 <- auto.arima(INPC_SUB_YUC_v2[4: 63,2], xreg=INPC_SUB_YUC_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_YUC <- cbind(fitINPC_SUB_YUC1$aic,fitINPC_SUB_YUC2$aic,fitINPC_SUB_YUC3$aic)
colnames(AIC_INPC_SUB_YUC)<-c("1 lag","2 lags", "3 lags")
# INPC_E - YUC
INPC_E_YUC_v<-as.vector(INPC_E_YUC)
CV_YUC_v<-as.vector(CV_YUC)
INPC_E_YUC_v2<-cbind(INPC_E_YUC_v,CV_YUC_v)
colnames(INPC_E_YUC_v2)<-c("INPC_E_YUC","CV_YUC")
a<- lag(INPC_E_YUC_v,0)
x<- lag(INPC_E_YUC_v,1)
y<- lag(INPC_E_YUC_v,2)
z<- lag(INPC_E_YUC_v,3)
INPC_E_YUC_lags <- cbind(x,y,z)

fitINPC_E_YUC1 <- auto.arima(INPC_E_YUC_v2[4: 63,2], xreg=INPC_E_YUC_lags[4: 63,1], d=0)
fitINPC_E_YUC2 <- auto.arima(INPC_E_YUC_v2[4: 63,2], xreg=INPC_E_YUC_lags[4: 63,1:2], d=0)
fitINPC_E_YUC3 <- auto.arima(INPC_E_YUC_v2[4: 63,2], xreg=INPC_E_YUC_lags[4: 63,1:3], d=0)
AIC_INPC_E_YUC <- cbind(fitINPC_E_YUC1$aic,fitINPC_E_YUC2$aic,fitINPC_E_YUC3$aic)
colnames(AIC_INPC_E_YUC)<-c("1 lag","2 lags", "3 lags")
# M1 - YUC
M1_YUC_v<-as.vector(M1_YUC)
```

```r
CV_YUC_v<-as.vector(CV_YUC)
M1_YUC_v2<-cbind(M1_YUC_v,CV_YUC_v)
colnames(M1_YUC_v2)<-c("M1_YUC","CV_YUC")
a<- lag(M1_YUC_v,0)
x<- lag(M1_YUC_v,1)
y<- lag(M1_YUC_v,2)
z<- lag(M1_YUC_v,3)
M1_YUC_lags <- cbind(x,y,z)

fitM1_YUC1 <- auto.arima(M1_YUC_v2[4: 63,2], xreg=M1_YUC_lags[4: 63,1], d=0)
fitM1_YUC2 <- auto.arima(M1_YUC_v2[4: 63,2], xreg=M1_YUC_lags[4: 63,1:2], d=0)
fitM1_YUC3 <- auto.arima(M1_YUC_v2[4: 63,2], xreg=M1_YUC_lags[4: 63,1:3], d=0)
AIC_M1_YUC <- cbind(fitM1_YUC1$aic,fitM1_YUC2$aic,fitM1_YUC3$aic)
colnames(AIC_M1_YUC)<-c("1 lag","2 lags", "3 lags")
# CONF - YUC
CONF_YUC_v<-as.vector(CONF_YUC)
CV_YUC_v<-as.vector(CV_YUC)
CONF_YUC_v2<-cbind(CONF_YUC_v,CV_YUC_v)
colnames(CONF_YUC_v2)<-c("CONF_YUC","CV_YUC")
a<- lag(CONF_YUC_v,0)
x<- lag(CONF_YUC_v,1)
y<- lag(CONF_YUC_v,2)
z<- lag(CONF_YUC_v,3)
CONF_YUC_lags <- cbind(x,y,z)

fitCONF_YUC1 <- auto.arima(CONF_YUC_v2[4: 63,2], xreg=CONF_YUC_lags[4: 63,1], d=0)
fitCONF_YUC2 <- auto.arima(CONF_YUC_v2[4: 63,2], xreg=CONF_YUC_lags[4: 63,1:2], d=0)
fitCONF_YUC3 <- auto.arima(CONF_YUC_v2[4: 63,2], xreg=CONF_YUC_lags[4: 63,1:3], d=0)
AIC_CONF_YUC <- cbind(fitCONF_YUC1$aic,fitCONF_YUC2$aic,fitCONF_YUC3$aic)
colnames(AIC_CONF_YUC)<-c("1 lag","2 lags", "3 lags")

AICs_YUC<-rbind(AIC_IPV_YUC,AIC_UNEMP_YUC,AIC_REM_YUC,AIC_GDP_YUC,AIC_INPC_SUB_YUC,AIC_INPC_E_YUC,AIC_M
rownames(AICs_YUC)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_YUC
```

```
##              1 lag   2 lags   3 lags
## IPV       91.54789 93.03471 94.95177
## DESEMPLEO 91.20554 90.75283 92.67891
## REMESAS   92.64376 94.23526 95.49883
## PIB       92.72668 90.27741 91.92103
## INPC_SUB  92.69940 90.59479 90.41513
## INPC_E    92.71827 91.74383 93.74184
## M1        92.76318 94.75148 90.76815
## CONF      92.57642 93.23714 95.04029
```

```r
# ZAC
# IPV - ZAC
IPV_ZAC_v<-as.vector(IPV_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
IPV_ZAC_v2<-cbind(IPV_ZAC_v,CV_ZAC_v)
colnames(IPV_ZAC_v2)<-c("IPV_ZAC","CV_ZAC")
a<- lag(IPV_ZAC_v,0)
x<- lag(IPV_ZAC_v,1)
```

```
y<- lag(IPV_ZAC_v,2)
z<- lag(IPV_ZAC_v,3)
IPV_ZAC_lags <- cbind(x,y,z)

fitIPV_ZAC1 <- auto.arima(IPV_ZAC_v2[4: 63,2], xreg=IPV_ZAC_lags[4: 63,1], d=0)
fitIPV_ZAC2 <- auto.arima(IPV_ZAC_v2[4: 63,2], xreg=IPV_ZAC_lags[4: 63,1:2], d=0)
fitIPV_ZAC3 <- auto.arima(IPV_ZAC_v2[4: 63,2], xreg=IPV_ZAC_lags[4: 63,1:3], d=0)
AIC_IPV_ZAC <- cbind(fitIPV_ZAC1$aic,fitIPV_ZAC2$aic,fitIPV_ZAC3$aic)
colnames(AIC_IPV_ZAC)<-c("1 lag","2 lags", "3 lags")
# UNEMP - ZAC
UNEMP_ZAC_v<-as.vector(UNEMP_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
UNEMP_ZAC_v2<-cbind(UNEMP_ZAC_v,CV_ZAC_v)
colnames(UNEMP_ZAC_v2)<-c("UNEMP_ZAC","CV_ZAC")
a<- lag(UNEMP_ZAC_v,0)
x<- lag(UNEMP_ZAC_v,1)
y<- lag(UNEMP_ZAC_v,2)
z<- lag(UNEMP_ZAC_v,3)
UNEMP_ZAC_lags <- cbind(x,y,z)

fitUNEMP_ZAC1 <- auto.arima(UNEMP_ZAC_v2[4: 63,2], xreg=UNEMP_ZAC_lags[4: 63,1], d=0)
fitUNEMP_ZAC2 <- auto.arima(UNEMP_ZAC_v2[4: 63,2], xreg=UNEMP_ZAC_lags[4: 63,1:2], d=0)
fitUNEMP_ZAC3 <- auto.arima(UNEMP_ZAC_v2[4: 63,2], xreg=UNEMP_ZAC_lags[4: 63,1:3], d=0)
AIC_UNEMP_ZAC <- cbind(fitUNEMP_ZAC1$aic,fitUNEMP_ZAC2$aic,fitUNEMP_ZAC3$aic)
colnames(AIC_UNEMP_ZAC)<-c("1 lag","2 lags", "3 lags")
# REM - ZAC
REM_ZAC_v<-as.vector(REM_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
REM_ZAC_v2<-cbind(REM_ZAC_v,CV_ZAC_v)
colnames(REM_ZAC_v2)<-c("REM_ZAC","CV_ZAC")
a<- lag(REM_ZAC_v,0)
x<- lag(REM_ZAC_v,1)
y<- lag(REM_ZAC_v,2)
z<- lag(REM_ZAC_v,3)
REM_ZAC_lags <- cbind(x,y,z)

fitREM_ZAC1 <- auto.arima(REM_ZAC_v2[4: 63,2], xreg=REM_ZAC_lags[4: 63,1], d=0)
fitREM_ZAC2 <- auto.arima(REM_ZAC_v2[4: 63,2], xreg=REM_ZAC_lags[4: 63,1:2], d=0)
fitREM_ZAC3 <- auto.arima(REM_ZAC_v2[4: 63,2], xreg=REM_ZAC_lags[4: 63,1:3], d=0)
AIC_REM_ZAC <- cbind(fitREM_ZAC1$aic,fitREM_ZAC2$aic,fitREM_ZAC3$aic)
colnames(AIC_REM_ZAC)<-c("1 lag","2 lags", "3 lags")
# GDP - ZAC
GDP_ZAC_v<-as.vector(GDP_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
GDP_ZAC_v2<-cbind(GDP_ZAC_v,CV_ZAC_v)
colnames(GDP_ZAC_v2)<-c("GDP_ZAC","CV_ZAC")
a<- lag(GDP_ZAC_v,0)
x<- lag(GDP_ZAC_v,1)
y<- lag(GDP_ZAC_v,2)
z<- lag(GDP_ZAC_v,3)
GDP_ZAC_lags <- cbind(x,y,z)

fitGDP_ZAC1 <- auto.arima(GDP_ZAC_v2[4: 63,2], xreg=GDP_ZAC_lags[4: 63,1], d=0)
```

```
fitGDP_ZAC2 <- auto.arima(GDP_ZAC_v2[4: 63,2], xreg=GDP_ZAC_lags[4: 63,1:2], d=0)
fitGDP_ZAC3 <- auto.arima(GDP_ZAC_v2[4: 63,2], xreg=GDP_ZAC_lags[4: 63,1:3], d=0)
AIC_GDP_ZAC <- cbind(fitGDP_ZAC1$aic,fitGDP_ZAC2$aic,fitGDP_ZAC3$aic)
colnames(AIC_GDP_ZAC)<-c("1 lag","2 lags", "3 lags")
# INPC_SUB - ZAC
INPC_SUB_ZAC_v<-as.vector(INPC_SUB_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
INPC_SUB_ZAC_v2<-cbind(INPC_SUB_ZAC_v,CV_ZAC_v)
colnames(INPC_SUB_ZAC_v2)<-c("INPC_SUB_ZAC","CV_ZAC")
a<- lag(INPC_SUB_ZAC_v,0)
x<- lag(INPC_SUB_ZAC_v,1)
y<- lag(INPC_SUB_ZAC_v,2)
z<- lag(INPC_SUB_ZAC_v,3)
INPC_SUB_ZAC_lags <- cbind(x,y,z)

fitINPC_SUB_ZAC1 <- auto.arima(INPC_SUB_ZAC_v2[4: 63,2], xreg=INPC_SUB_ZAC_lags[4: 63,1], d=0)
fitINPC_SUB_ZAC2 <- auto.arima(INPC_SUB_ZAC_v2[4: 63,2], xreg=INPC_SUB_ZAC_lags[4: 63,1:2], d=0)
fitINPC_SUB_ZAC3 <- auto.arima(INPC_SUB_ZAC_v2[4: 63,2], xreg=INPC_SUB_ZAC_lags[4: 63,1:3], d=0)
AIC_INPC_SUB_ZAC <- cbind(fitINPC_SUB_ZAC1$aic,fitINPC_SUB_ZAC2$aic,fitINPC_SUB_ZAC3$aic)
colnames(AIC_INPC_SUB_ZAC)<-c("1 lag","2 lags", "3 lags")
# INPC_E - ZAC
INPC_E_ZAC_v<-as.vector(INPC_E_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
INPC_E_ZAC_v2<-cbind(INPC_E_ZAC_v,CV_ZAC_v)
colnames(INPC_E_ZAC_v2)<-c("INPC_E_ZAC","CV_ZAC")
a<- lag(INPC_E_ZAC_v,0)
x<- lag(INPC_E_ZAC_v,1)
y<- lag(INPC_E_ZAC_v,2)
z<- lag(INPC_E_ZAC_v,3)
INPC_E_ZAC_lags <- cbind(x,y,z)

fitINPC_E_ZAC1 <- auto.arima(INPC_E_ZAC_v2[4: 63,2], xreg=INPC_E_ZAC_lags[4: 63,1], d=0)
fitINPC_E_ZAC2 <- auto.arima(INPC_E_ZAC_v2[4: 63,2], xreg=INPC_E_ZAC_lags[4: 63,1:2], d=0)
fitINPC_E_ZAC3 <- auto.arima(INPC_E_ZAC_v2[4: 63,2], xreg=INPC_E_ZAC_lags[4: 63,1:3], d=0)
AIC_INPC_E_ZAC <- cbind(fitINPC_E_ZAC1$aic,fitINPC_E_ZAC2$aic,fitINPC_E_ZAC3$aic)
colnames(AIC_INPC_E_ZAC)<-c("1 lag","2 lags", "3 lags")
# M1 - ZAC
M1_ZAC_v<-as.vector(M1_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
M1_ZAC_v2<-cbind(M1_ZAC_v,CV_ZAC_v)
colnames(M1_ZAC_v2)<-c("M1_ZAC","CV_ZAC")
a<- lag(M1_ZAC_v,0)
x<- lag(M1_ZAC_v,1)
y<- lag(M1_ZAC_v,2)
z<- lag(M1_ZAC_v,3)
M1_ZAC_lags <- cbind(x,y,z)

fitM1_ZAC1 <- auto.arima(M1_ZAC_v2[4: 63,2], xreg=M1_ZAC_lags[4: 63,1], d=0)
fitM1_ZAC2 <- auto.arima(M1_ZAC_v2[4: 63,2], xreg=M1_ZAC_lags[4: 63,1:2], d=0)
fitM1_ZAC3 <- auto.arima(M1_ZAC_v2[4: 63,2], xreg=M1_ZAC_lags[4: 63,1:3], d=0)
AIC_M1_ZAC <- cbind(fitM1_ZAC1$aic,fitM1_ZAC2$aic,fitM1_ZAC3$aic)
colnames(AIC_M1_ZAC)<-c("1 lag","2 lags", "3 lags")
# CONF - ZAC
```

```
CONF_ZAC_v<-as.vector(CONF_ZAC)
CV_ZAC_v<-as.vector(CV_ZAC)
CONF_ZAC_v2<-cbind(CONF_ZAC_v,CV_ZAC_v)
colnames(CONF_ZAC_v2)<-c("CONF_ZAC","CV_ZAC")
a<- lag(CONF_ZAC_v,0)
x<- lag(CONF_ZAC_v,1)
y<- lag(CONF_ZAC_v,2)
z<- lag(CONF_ZAC_v,3)
CONF_ZAC_lags <- cbind(x,y,z)

fitCONF_ZAC1 <- auto.arima(CONF_ZAC_v2[4: 63,2], xreg=CONF_ZAC_lags[4: 63,1], d=0)
fitCONF_ZAC2 <- auto.arima(CONF_ZAC_v2[4: 63,2], xreg=CONF_ZAC_lags[4: 63,1:2], d=0)
fitCONF_ZAC3 <- auto.arima(CONF_ZAC_v2[4: 63,2], xreg=CONF_ZAC_lags[4: 63,1:3], d=0)
AIC_CONF_ZAC <- cbind(fitCONF_ZAC1$aic,fitCONF_ZAC2$aic,fitCONF_ZAC3$aic)
colnames(AIC_CONF_ZAC)<-c("1 lag","2 lags", "3 lags")

AICs_ZAC<-rbind(AIC_IPV_ZAC,AIC_UNEMP_ZAC,AIC_REM_ZAC,AIC_GDP_ZAC,AIC_INPC_SUB_ZAC,AIC_INPC_E_ZAC,AIC_M
rownames(AICs_ZAC)<-c("IPV", "DESEMPLEO", "REMESAS","PIB","INPC_SUB","INPC_E", "M1", "CONF")
AICs_ZAC
```

```
##              1 lag   2 lags   3 lags
## IPV       224.9168 226.4935 227.3293
## DESEMPLEO 226.7249 228.4316 230.4244
## REMESAS   225.1930 227.0736 229.0233
## PIB       226.8074 228.5686 228.9120
## INPC_SUB  226.7593 228.3980 230.2404
## INPC_E    226.5821 228.5723 229.5306
## M1        226.6028 227.8424 229.8388
## CONF      226.8194 228.8188 229.8309
```

7 MODELOS ESTATALES

```
AGS_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 1)), start=c(2005,2), end=c(2020,4),  freque
BC_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 2)), start=c(2005,2), end=c(2020,4),   freque
BCS_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 3)), start=c(2005,2), end=c(2020,4),   freque
CAMP_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 4)), start=c(2005,2), end=c(2020,4),   freq
CDMX_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 5)), start=c(2005,2), end=c(2020,4),   freq
CHIH_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 6)), start=c(2005,2), end=c(2020,4),   freq
CHIS_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 7)), start=c(2005,2), end=c(2020,4),   freq
COAH_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 8)), start=c(2005,2), end=c(2020,4),   freq
COL_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 9)), start=c(2005,2), end=c(2020,4),   freque
DGO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 10)), start=c(2005,2), end=c(2020,4),   freq
GRO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 11)), start=c(2005,2), end=c(2020,4),   freq
GTO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 12)), start=c(2005,2), end=c(2020,4),   freq
HGO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 13)), start=c(2005,2), end=c(2020,4),   freq
JAL_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 14)), start=c(2005,2), end=c(2020,4),   freq
MEX_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 15)), start=c(2005,2), end=c(2020,4),   freq
MICH_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 16)), start=c(2005,2), end=c(2020,4),   fre
MOR_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 17)), start=c(2005,2), end=c(2020,4),   freq
NAY_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 18)), start=c(2005,2), end=c(2020,4),   freq
```

```
NL_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 19)), start=c(2005,2),  end=c(2020,4),  freque
OAXACA_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 20)), start=c(2005,2), end=c(2020,4),    fr
PUE_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 21)), start=c(2005,2), end=c(2020,4),   frequ
Q_ROO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 22)), start=c(2005,2), end=c(2020,4),   fre
QRO_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 23)), start=c(2005,2), end=c(2020,4),   frequ
SIN_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 24)), start=c(2005,2), end=c(2020,4),   frequ
SLP_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 25)), start=c(2005,2), end=c(2020,4),   frequ
SON_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 26)), start=c(2005,2), end=c(2020,4),   frequ
TAB_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 27)), start=c(2005,2), end=c(2020,4),   frequ
TAMPS_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 28)), start=c(2005,2), end=c(2020,4),    fr
TLAX_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 29)), start=c(2005,2), end=c(2020,4),   freq
VER_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 30)), start=c(2005,2), end=c(2020,4),   frequ
YUC_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 31)), start=c(2005,2), end=c(2020,4),   frequ
ZAC_LAGS<-ts(data=(read_excel("ESTADOS LAGS.xlsx", sheet = 32)), start=c(2005,2), end=c(2020,4),   frequ
```

```
training_set_AGS<-ts(AGS_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_BC<-ts(BC_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_BCS<-ts(BCS_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_CAMP<-ts(CAMP_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_CDMX<-ts(CDMX_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_CHIH<-ts(CHIH_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_CHIS<-ts(CHIS_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_COAH<-ts(COAH_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_COL<-ts(COL_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_DGO<-ts(DGO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_GRO<-ts(GRO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_GTO<-ts(GTO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_HGO<-ts(HGO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_JAL<-ts(JAL_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_MEX<-ts(MEX_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_MICH<-ts(MICH_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_MOR<-ts(MOR_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_NAY<-ts(NAY_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_NL<-ts(NL_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_OAXACA<-ts(OAXACA_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_PUE<-ts(PUE_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_Q_ROO<-ts(Q_ROO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_QRO<-ts(QRO_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_SIN<-ts(SIN_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_SLP<-ts(SLP_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_SON<-ts(SON_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_TAB<-ts(TAB_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_TAMPS<-ts(TAMPS_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_TLAX<-ts(TLAX_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_VER<-ts(VER_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_YUC<-ts(YUC_LAGS[1:59,],start = c(2006,1),frequency=4)
training_set_ZAC<-ts(ZAC_LAGS[1:59,],start = c(2006,1),frequency=4)
```

```
# MODELOS

# AGS

modelo_AGS <- auto.arima(training_set_AGS[,"CV"],
```

```
                        xreg=training_set_AGS[,-c(1)])
# BC

modelo_BC <- auto.arima(training_set_BC[,"CV"],
                        xreg=training_set_BC[,-c(1)])
# BCS

modelo_BCS <- auto.arima(training_set_BCS[,"CV"],
                        xreg=training_set_BCS[,-c(1)])
# CAMP

modelo_CAMP <- auto.arima(training_set_CAMP[,"CV"],
                        xreg=training_set_CAMP[,-c(1)])
# CDMX

modelo_CDMX <- auto.arima(training_set_CDMX[,"CV"],
                        xreg=training_set_CDMX[,-c(1)])
# CHIH

modelo_CHIH <- auto.arima(training_set_CHIH[,"CV"],
                        xreg=training_set_CHIH[,-c(1)])
# CHIS

modelo_CHIS <- auto.arima(training_set_CHIS[,"CV"],
                        xreg=training_set_CHIS[,-c(1)])
# COAH

modelo_COAH <- auto.arima(training_set_COAH[,"CV"],
                        xreg=training_set_COAH[,-c(1)])
# COL

modelo_COL <- auto.arima(training_set_COL[,"CV"],
                        xreg=training_set_COL[,-c(1)])
# DGO

modelo_DGO <- auto.arima(training_set_DGO[,"CV"],
                        xreg=training_set_DGO[,-c(1)])
# GRO

modelo_GRO <- auto.arima(training_set_GRO[,"CV"],
                        xreg=training_set_GRO[,-c(1)])
# GTO

modelo_GTO <- auto.arima(training_set_GTO[,"CV"],
                        xreg=training_set_GTO[,-c(1)])
# HGO

modelo_HGO <- auto.arima(training_set_HGO[,"CV"],
                        xreg=training_set_HGO[,-c(1)])
# JAL

modelo_JAL <- auto.arima(training_set_JAL[,"CV"],
                        xreg=training_set_JAL[,-c(1)])
```

```r
# MEX

modelo_MEX <- auto.arima(training_set_MEX[,"CV"],
                         xreg=training_set_MEX[,-c(1)])
# MICH

modelo_MICH <- auto.arima(training_set_MICH[,"CV"],
                         xreg=training_set_MICH[,-c(1)])
# MOR

modelo_MOR <- auto.arima(training_set_MOR[,"CV"],
                         xreg=training_set_MOR[,-c(1)])
# NAY

modelo_NAY <- auto.arima(training_set_NAY[,"CV"],
                         xreg=training_set_NAY[,-c(1)])
# NL

modelo_NL <- auto.arima(training_set_NL[,"CV"],
                         xreg=training_set_NL[,-c(1)])
# OAXACA

modelo_OAXACA <- auto.arima(training_set_OAXACA[,"CV"],
                         xreg=training_set_OAXACA[,-c(1)])
# PUE

modelo_PUE <- auto.arima(training_set_PUE[,"CV"],
                         xreg=training_set_PUE[,-c(1)])
# Q_ROO

modelo_Q_ROO <- auto.arima(training_set_Q_ROO[,"CV"],
                         xreg=training_set_Q_ROO[,-c(1)])
# QRO

modelo_QRO <- auto.arima(training_set_QRO[,"CV"],
                         xreg=training_set_QRO[,-c(1)])
# SIN

modelo_SIN <- auto.arima(training_set_SIN[,"CV"],
                         xreg=training_set_SIN[,-c(1)])
# SLP

modelo_SLP <- auto.arima(training_set_SLP[,"CV"],
                         xreg=training_set_SLP[,-c(1)])
# SON

modelo_SON <- auto.arima(training_set_SON[,"CV"],
                         xreg=training_set_SON[,-c(1)])
# TAB

modelo_TAB <- auto.arima(training_set_TAB[,"CV"],
                         xreg=training_set_TAB[,-c(1)])
# TAMPS
```

```r
modelo_TAMPS <- auto.arima(training_set_TAMPS[,"CV"],
                           xreg=training_set_TAMPS[,-c(1)])
# TLAX

modelo_TLAX <- auto.arima(training_set_TLAX[,"CV"],
                           xreg=training_set_TLAX[,-c(1)])
# VER

modelo_VER <- auto.arima(training_set_VER[,"CV"],
                           xreg=training_set_VER[,-c(1)])
# YUC

modelo_YUC <- auto.arima(training_set_YUC[,"CV"],
                           xreg=training_set_YUC[,-c(1)])
# ZAC

modelo_ZAC <- auto.arima(training_set_ZAC[,"CV"],
                           xreg=training_set_ZAC[,-c(1)])
```

```r
AIC_MODELOS_ESTATALES <- rbind(modelo_AGS$aic,modelo_BC$aic,modelo_BCS$aic,modelo_CAMP$aic,modelo_CDMX$a

AIC_MODELOS_ESTATALES
```

```
##             [,1]
##  [1,] 402.08769
##  [2,]  67.92866
##  [3,] 146.35166
##  [4,] -11.34093
##  [5,] 108.24789
##  [6,] 124.62692
##  [7,] 109.11925
##  [8,]  81.93735
##  [9,] 124.47644
## [10,] 100.60297
## [11,] 137.07398
## [12,] 105.13697
## [13,] 146.34235
## [14,] 138.07871
## [15,]  55.55365
## [16,] 107.25213
## [17,] 195.28352
## [18,]  75.61206
## [19,]  34.32493
## [20,]  55.20430
## [21,] 103.55542
## [22,] 153.06048
## [23,]  47.24522
## [24,] 127.60563
## [25,]  63.61165
## [26,] 114.88760
## [27,] 100.09501
## [28,]  57.49544
## [29,] 156.07230
```

```
## [30,]  98.70853
## [31,] 102.70756
## [32,] 228.49577
```