Econometría Financiera

Práctica 1: Estimaciones de modelos ARIMA

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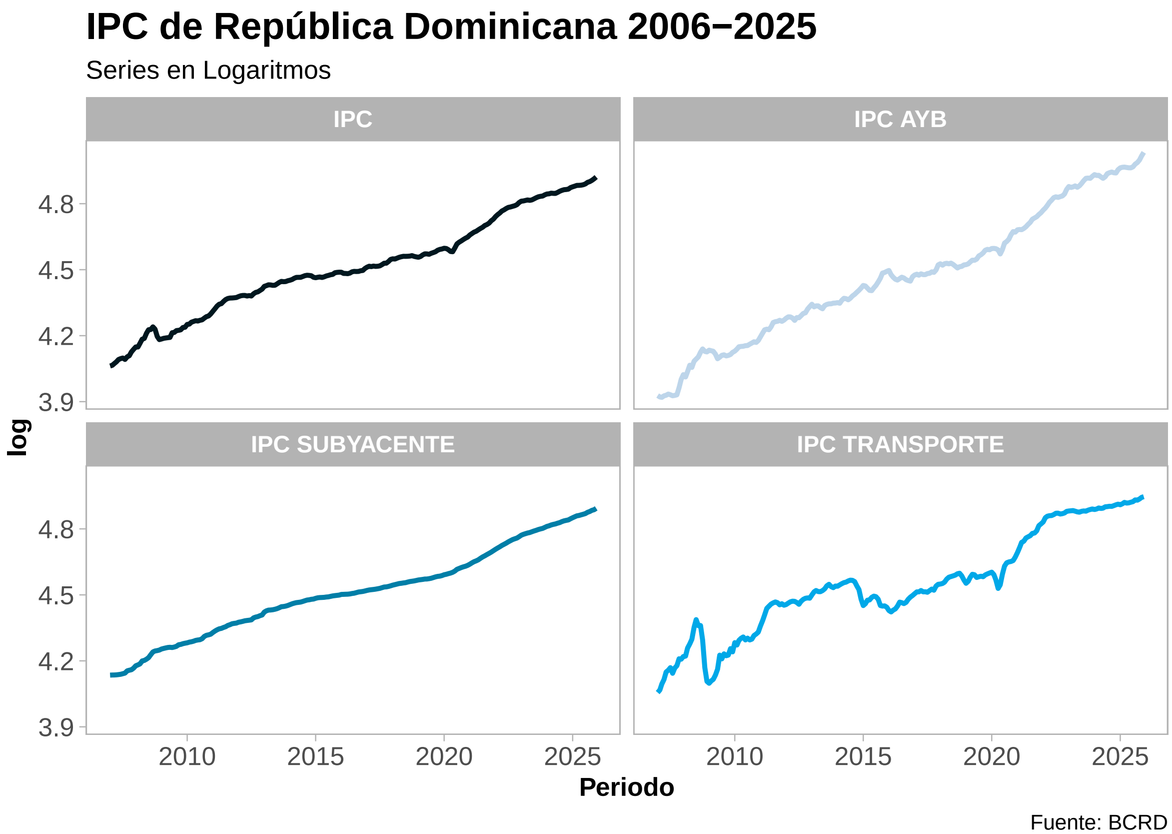
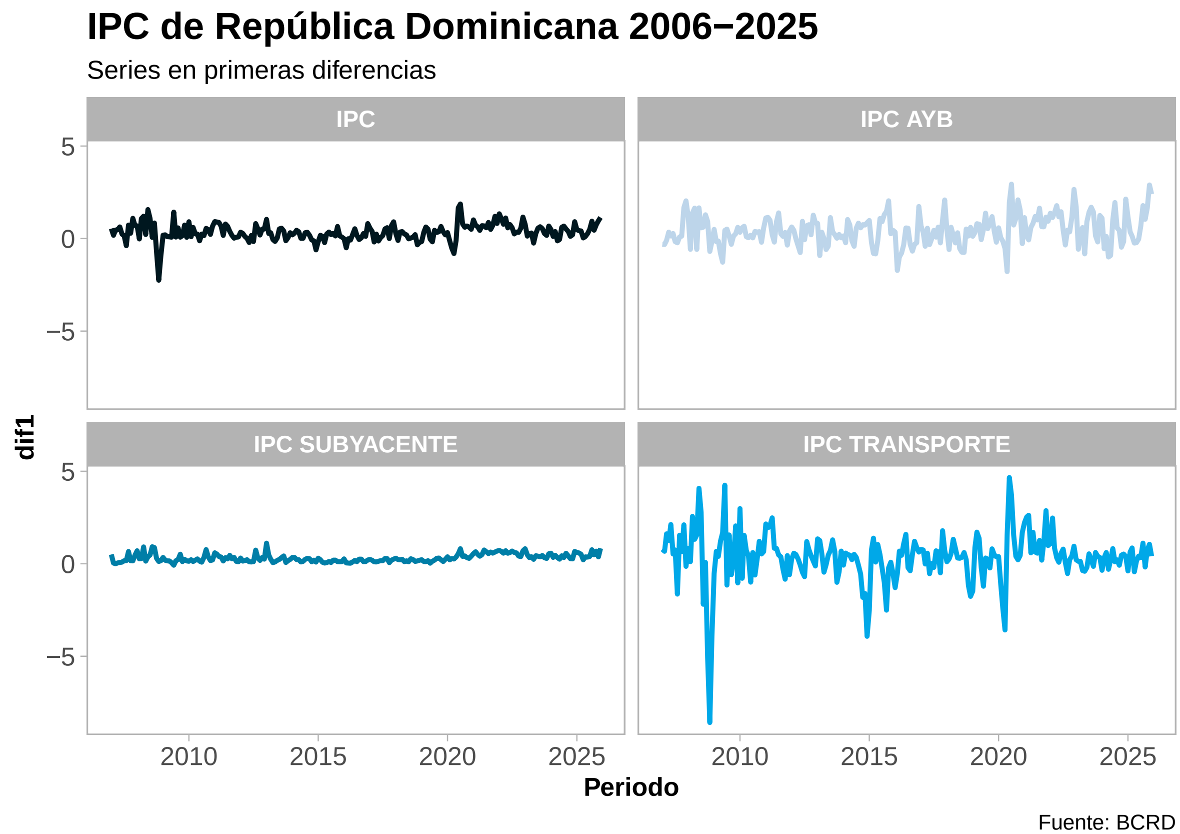
Visualización de las Series

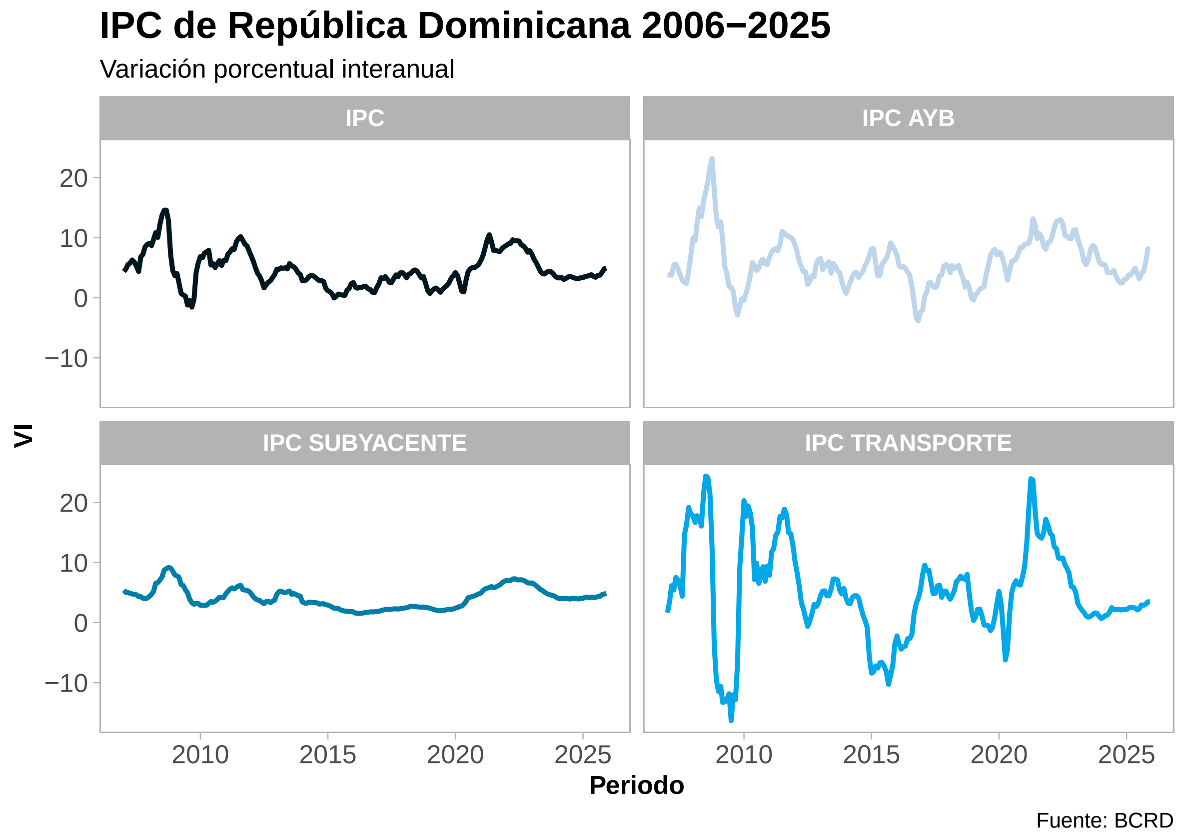
Series en logaritmos



Series en primeras diferencias



Series en VI


IPC de República Dominicana 2006−2025
Variación porcentual interanual
IPC
IPC AYB
IPC SUBYACENTE
IPC TRANSPORTE
VI
20
10
0
−10
2010
2015
2020
2025
Periodo
Fuente: BCRD

Análisis de Raíz Unitaria

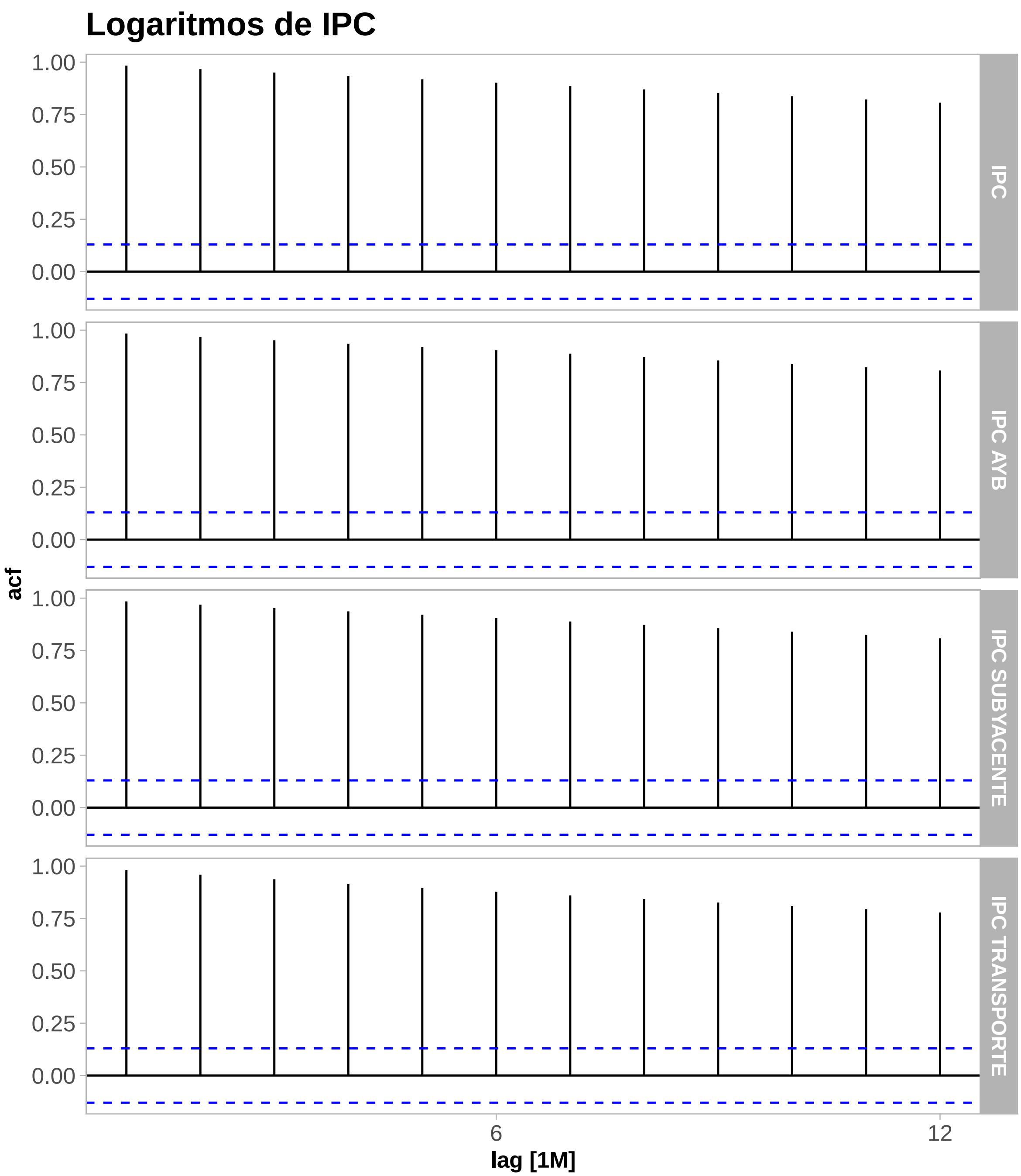
Prueba Dickey-Fuller Aumentada (ADF).

Tabla 1

Resultados del test de Dickey-Fuller aumentado (ADF) con tendencia

Serie	Estadístico ADF (τ_3)	Valor crítico 5 %	Nivel de significancia	Conclusión
IPC	-2.013	-3.43	5 %	No estacionaria
IPC subyacente	-1.813	-3.43	5 %	No estacionaria
IPC A&B	-2.088	-3.43	5 %	No estacionaria
IPC transporte	-2.624	-3.43	5 %	No estacionaria

Los resultados del test de Dickey-Fuller aumentado (ADF) con término constante y tendencia determinística indican que ninguna de las series en niveles rechaza la hipótesis nula de presencia de raíz unitaria al 5 % de significancia, Apéndice A. En consecuencia, se concluye que las series no son estacionarias en niveles. Dado que la no estacionariedad puede generar regresiones espurias y sesgar la inferencia estadística, se procede a transformar las series mediante diferenciación de primer orden, con el objetivo de inducir estacionariedad y garantizar la validez de los resultados econométricos posteriores.


Logaritmos de IPC
IPC
IPC AYB
IPC SUBYACENTE
IPC TRANSPORTE
1.00
0.75
0.50
0.25
0.00
acf
6
12
lag [1M]

Apéndices

Apéndice A {#apendice-a} : Dickey-Fuller Aumentada - series logaritmos

```
purrr::map(test_log, summary)
```

```
$ipc

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

Test regression trend


Call:
lm(formula = z.diff ~ z.lag.1 + 1 + tt + z.diff.lag)

Residuals:
       Min         1Q     Median         3Q        Max
-0.0301829 -0.0023644 -0.0000173  0.0021730  0.0191807

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  7.777e-02  3.732e-02   2.084   0.0383 *
z.lag.1     -1.847e-02  9.172e-03  -2.013   0.0452 *
tt           6.116e-05  3.184e-05   1.921   0.0560 .
z.diff.lag1  4.111e-01  6.557e-02   6.270 1.79e-09 ***
z.diff.lag2  1.934e-02  7.095e-02   0.273   0.7855
z.diff.lag3  2.312e-02  7.095e-02   0.326   0.7449
z.diff.lag4 -5.155e-02  6.579e-02  -0.784   0.4341
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.005088 on 228 degrees of freedom
Multiple R-squared:  0.1916,    Adjusted R-squared:  0.1703
F-statistic: 9.007 on 6 and 228 DF,  p-value: 7.749e-09


Value of test-statistic is: -2.0134 9.7486 2.1247
```

```
Critical values for test statistics:
      1pct  5pct 10pct
tau3 -3.99 -3.43 -3.13
phi2  6.22  4.75  4.07
phi3  8.43  6.49  5.47


$ipc_subyacente

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

Test regression trend


Call:
lm(formula = z.diff ~ z.lag.1 + 1 + tt + z.diff.lag)

Residuals:
       Min         1Q     Median         3Q        Max
-0.0072803 -0.0011502 -0.0003454  0.0008352  0.0104388

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.837e-02  2.045e-02   1.877 0.061811 .
z.lag.1     -9.003e-03  4.965e-03  -1.813 0.071096 .
tt           2.726e-05  1.542e-05   1.767 0.078486 .
z.diff.lag1  4.055e-01  6.459e-02   6.277 1.72e-09 ***
z.diff.lag2 -2.251e-02  7.011e-02  -0.321 0.748456
z.diff.lag3  4.616e-02  6.996e-02   0.660 0.510024
z.diff.lag4  2.212e-01  6.448e-02   3.431 0.000714 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.002086 on 228 degrees of freedom
Multiple R-squared:  0.2673,    Adjusted R-squared:  0.248
F-statistic: 13.86 on 6 and 228 DF,  p-value: 2e-13


Value of test-statistic is: -1.8133 6.7248 1.6713

Critical values for test statistics:
```

```
      1pct  5pct 10pct
tau3 -3.99 -3.43 -3.13
phi2  6.22  4.75  4.07
phi3  8.43  6.49  5.47


$ipc_ayb

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

Test regression trend


Call:
lm(formula = z.diff ~ z.lag.1 + 1 + tt + z.diff.lag)

Residuals:
       Min         1Q     Median         3Q        Max
-0.0216470 -0.0052201  0.0000209  0.0050964  0.0294287

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.121e-01  5.200e-02   2.155   0.0322 *
z.lag.1     -2.785e-02  1.334e-02  -2.088   0.0379 *
tt           1.248e-04  6.005e-05   2.078   0.0389 *
z.diff.lag1  4.054e-01  6.539e-02   6.199 2.63e-09 ***
z.diff.lag2 -1.710e-01  6.981e-02  -2.449   0.0151 *
z.diff.lag3  1.764e-01  6.954e-02   2.537   0.0119 *
z.diff.lag4 -8.117e-02  6.590e-02  -1.232   0.2194
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.008334 on 228 degrees of freedom
Multiple R-squared:  0.1612,    Adjusted R-squared:  0.1392
F-statistic: 7.304 on 6 and 228 DF,  p-value: 3.747e-07


Value of test-statistic is: -2.0881 9.6944 2.1821

Critical values for test statistics:
      1pct  5pct 10pct
```

```
tau3 -3.99 -3.43 -3.13
phi2  6.22  4.75  4.07
phi3  8.43  6.49  5.47


$ipc_transporte

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

Test regression trend


Call:
lm(formula = z.diff ~ z.lag.1 + 1 + tt + z.diff.lag)

Residuals:
      Min        1Q    Median        3Q       Max
-0.094862 -0.004228  0.000481  0.006097  0.046152

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.604e-01  6.009e-02   2.669  0.00815 **
z.lag.1     -3.837e-02  1.462e-02  -2.624  0.00927 **
tt           1.283e-04  5.221e-05   2.458  0.01471 *
z.diff.lag1  4.390e-01  6.498e-02   6.756 1.17e-10 ***
z.diff.lag2  1.017e-01  7.053e-02   1.442  0.15080
z.diff.lag3 -6.801e-02  7.072e-02  -0.962  0.33719
z.diff.lag4 -6.709e-02  6.563e-02  -1.022  0.30778
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.01558 on 228 degrees of freedom
Multiple R-squared:  0.2496,    Adjusted R-squared:  0.2299
F-statistic: 12.64 on 6 and 228 DF,  p-value: 2.659e-12


Value of test-statistic is: -2.6242 4.0776 3.4619

Critical values for test statistics:
      1pct  5pct 10pct
tau3 -3.99 -3.43 -3.13
```

phi2	6.22	4.75	4.07
phi3	8.43	6.49	5.47