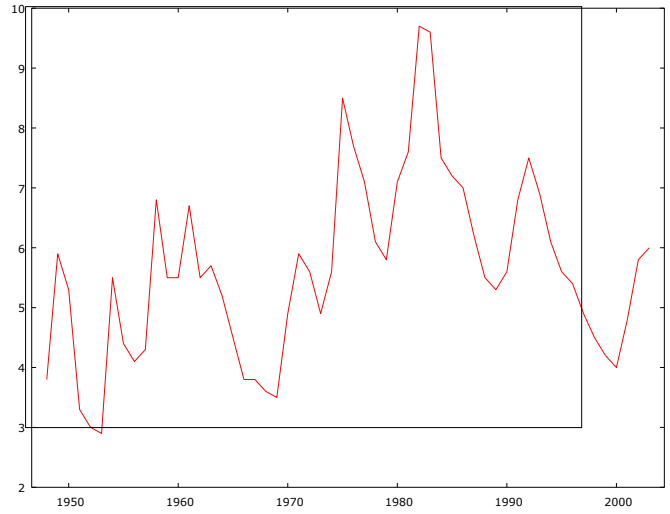
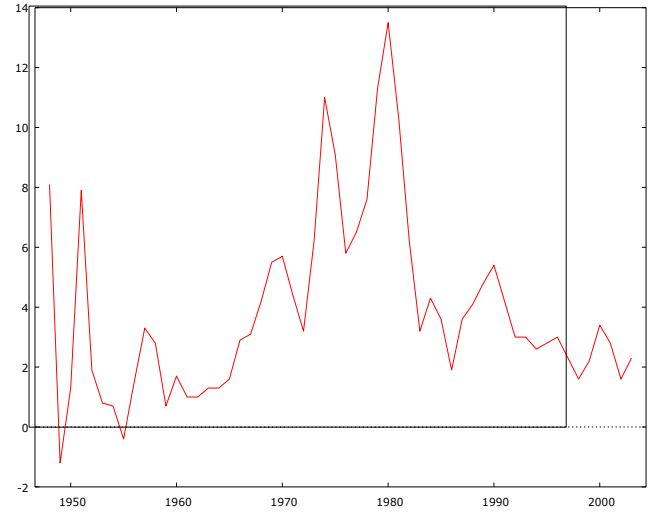
ECONOMETRÍA II – Curso 2014
PRÁCTICO 13
Regresiones espurias y cointegración – SALIDAS DE GRETL

Analice gráficamente ambas series en niveles y en diferencias.

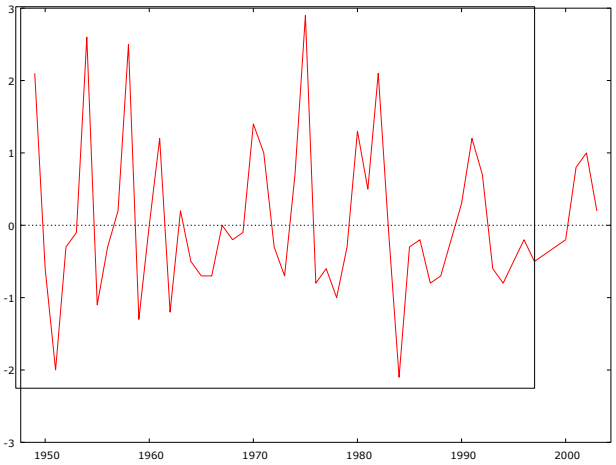
Desempleo



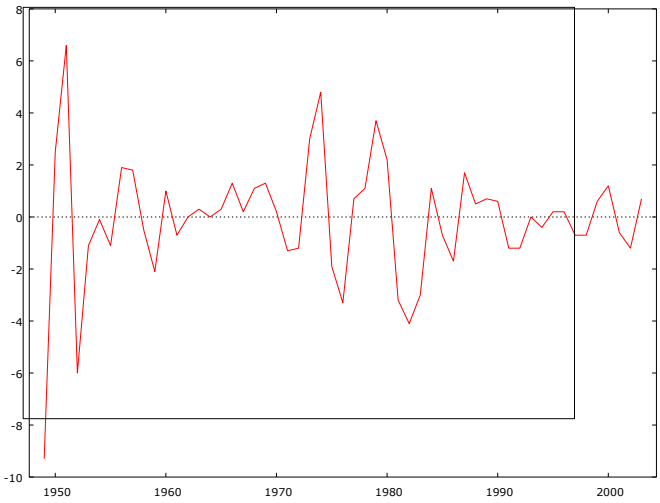
Inflación



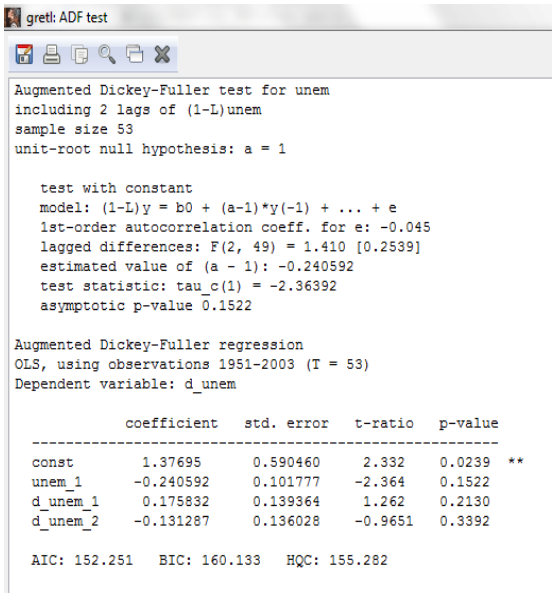
Δ^1 Desempleo



Δ^1 Inflación



Determine el orden de integración de ambas series utilizando el testdeDickey – Fuller. Comience la prueba especificando la regresión auxiliar sólo con constante y 2 rezagos de la variable dependiente.



gretl: ADF test

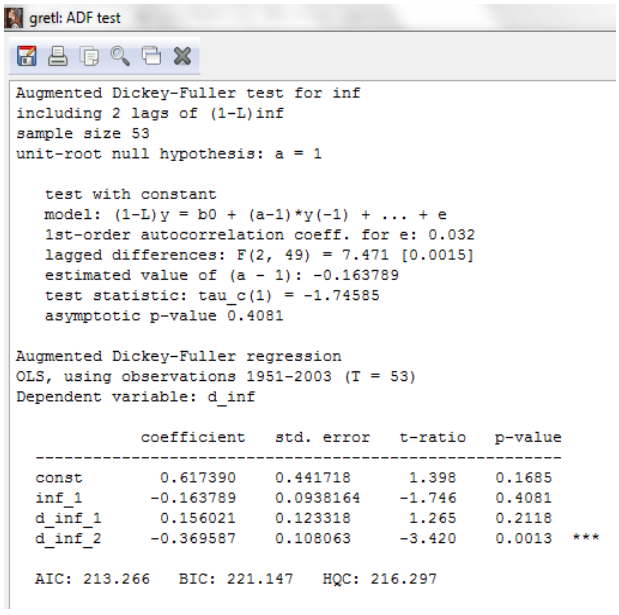
```
Augmented Dickey-Fuller test for unem
including 2 lags of (1-L)unem
sample size 53
unit-root null hypothesis: a = 1

   test with constant
   model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: -0.045
   lagged differences: F(2, 49) = 1.410 [0.2539]
   estimated value of (a - 1): -0.240592
   test statistic: tau_c(1) = -2.36392
   asymptotic p-value 0.1522

Augmented Dickey-Fuller regression
OLS, using observations 1951-2003 (T = 53)
Dependent variable: d_unem

            coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const        1.37695      0.590460     2.332    0.0239  **
  unem_1      -0.240592     0.101777    -2.364    0.1522
  d_unem_1     0.175832     0.139364     1.262    0.2130
  d_unem_2    -0.131287     0.136028    -0.9651   0.3392

  AIC: 152.251   BIC: 160.133   HQC: 155.282
```



gretl: ADF test

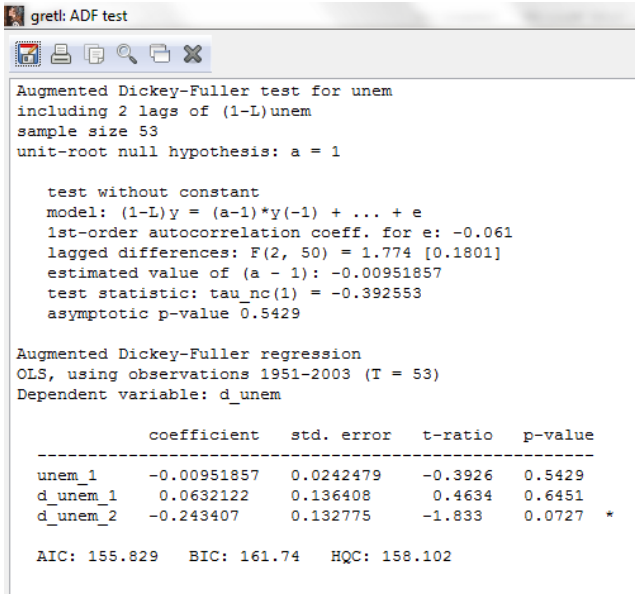
```
Augmented Dickey-Fuller test for inf
including 2 lags of (1-L)inf
sample size 53
unit-root null hypothesis: a = 1

   test with constant
   model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: 0.032
   lagged differences: F(2, 49) = 7.471 [0.0015]
   estimated value of (a - 1): -0.163789
   test statistic: tau_c(1) = -1.74585
   asymptotic p-value 0.4081

Augmented Dickey-Fuller regression
OLS, using observations 1951-2003 (T = 53)
Dependent variable: d_inf

            coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const        0.617390     0.441718     1.398    0.1685
  inf_1       -0.163789     0.0938164   -1.746    0.4081
  d_inf_1      0.156021     0.123318     1.265    0.2118
  d_inf_2     -0.369587     0.108063    -3.420    0.0013  ***

  AIC: 213.266   BIC: 221.147   HQC: 216.297
```



gretl: ADF test

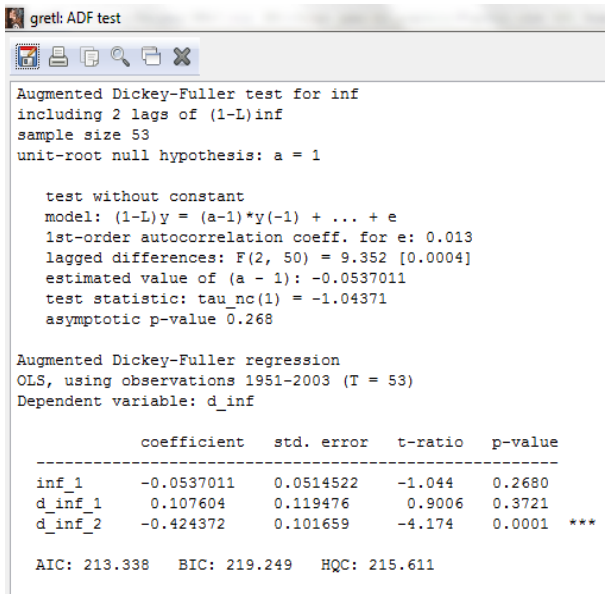
```
Augmented Dickey-Fuller test for unem
including 2 lags of (1-L)unem
sample size 53
unit-root null hypothesis: a = 1

   test without constant
   model: (1-L)y = (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: -0.061
   lagged differences: F(2, 50) = 1.774 [0.1801]
   estimated value of (a - 1): -0.00951857
   test statistic: tau_nc(1) = -0.392553
   asymptotic p-value 0.5429

Augmented Dickey-Fuller regression
OLS, using observations 1951-2003 (T = 53)
Dependent variable: d_unem

             coefficient   std. error   t-ratio   p-value
  ----------------------------------------------------------
  unem_1     -0.00951857   0.0242479    -0.3926   0.5429
  d_unem_1    0.0632122    0.136408      0.4634   0.6451
  d_unem_2   -0.243407     0.132775     -1.833    0.0727  *

  AIC: 155.829   BIC: 161.74   HQC: 158.102
```



gretl: ADF test

```
Augmented Dickey-Fuller test for inf
including 2 lags of (1-L)inf
sample size 53
unit-root null hypothesis: a = 1

   test without constant
   model: (1-L)y = (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: 0.013
   lagged differences: F(2, 50) = 9.352 [0.0004]
   estimated value of (a - 1): -0.0537011
   test statistic: tau_nc(1) = -1.04371
   asymptotic p-value 0.268

Augmented Dickey-Fuller regression
OLS, using observations 1951-2003 (T = 53)
Dependent variable: d_inf

             coefficient   std. error   t-ratio   p-value
  ----------------------------------------------------------
  inf_1      -0.0537011    0.0514522    -1.044    0.2680
  d_inf_1     0.107604     0.119476      0.9006   0.3721
  d_inf_2    -0.424372     0.101659     -4.174    0.0001  ***

  AIC: 213.338   BIC: 219.249   HQC: 215.611
```

gretl: ADF test

```
Augmented Dickey-Fuller test for d_unem
including 2 lags of (1-L)d_unem
sample size 52
unit-root null hypothesis: a = 1

   test with constant
   model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: -0.013
   lagged differences: F(2, 48) = 1.871 [0.1650]
   estimated value of (a - 1): -1.37085
   test statistic: tau_c(1) = -5.48698
   asymptotic p-value 1.855e-006

Augmented Dickey-Fuller regression
OLS, using observations 1952-2003 (T = 52)
Dependent variable: d_d_unem

              coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const         0.0486822    0.139428     0.3492   0.7285
  d_unem_1     -1.37085      0.249837    -5.487    1.85e-06 ***
  d_d_unem_1    0.363940     0.188234     1.933    0.0591   *
  d_d_unem_2    0.175655     0.134920     1.302    0.1992

  AIC: 151.941   BIC: 159.746   HQC: 154.933
```

gretl: ADF test

```
Augmented Dickey-Fuller test for d_inf
including 2 lags of (1-L)d_inf
sample size 52
unit-root null hypothesis: a = 1

   test with constant
   model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
   1st-order autocorrelation coeff. for e: 0.139
   lagged differences: F(2, 48) = 4.592 [0.0150]
   estimated value of (a - 1): -1.18525
   test statistic: tau_c(1) = -4.81511
   asymptotic p-value 4.803e-005

Augmented Dickey-Fuller regression
OLS, using observations 1952-2003 (T = 52)
Dependent variable: d_d_inf

              coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const        -0.0744191    0.245305    -0.3034   0.7629
  d_inf_1      -1.18525      0.246152    -4.815    4.80e-05 ***
  d_d_inf_1     0.278332     0.163115     1.706    0.0944   *
  d_d_inf_2    -0.0741155    0.117876    -0.6288   0.5325

  AIC: 210.558   BIC: 218.363   HQC: 213.55
```

Estime una regresión con unem como variable dependiente e inf como regresor. Explique porqué la prueba de significación del coeficiente de inf en esta ecuación no tiene validez.

gretl: model 1

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```
Model 1: OLS, using observations 1948-2003 (T = 56)
Dependent variable: unem

              coefficient   std. error   t-ratio    p-value
  ------------------------------------------------------------
  const        5.15341      0.321480     16.03     3.51e-022 ***
  inf          0.123719     0.0653990     1.892    0.0639    *

Mean dependent var   5.633929   S.D. dependent var   1.508796
Sum squared resid    117.4236   S.E. of regression   1.474622
R-squared            0.062154   Adjusted R-squared   0.044786
F(1, 54)             3.578726   P-value(F)           0.063892
Log-likelihood      -100.1928   Akaike criterion     204.3855
Schwarz criterion    208.4362   Hannan-Quinn         205.9560
rho                  0.641537   Durbin-Watson        0.670436
```

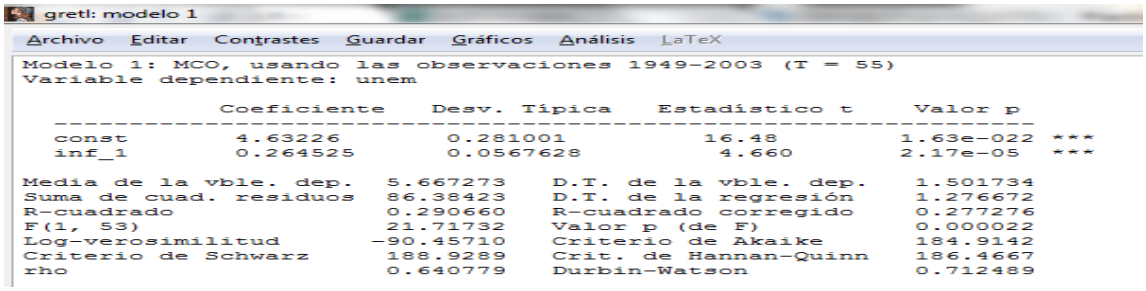
Indique si en base a la información disponible es posible afirmar que existe una Curva de Phillips de largo plazo. En caso contrario, haga las pruebas necesarias al 1% de significación, teniendo especial cuidado en los valores críticos utilizados.

gretl: ADF test

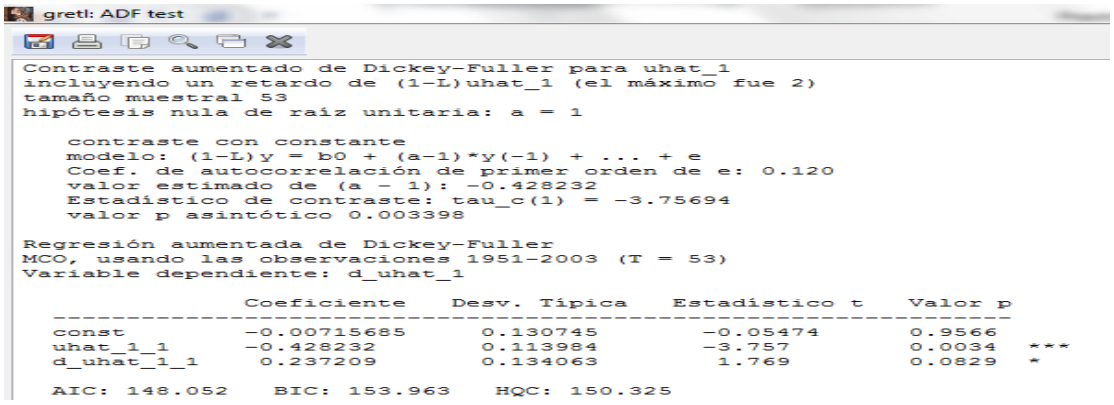
```
Contraste de Dickey-Fuller para uhat
tamaño muestral 55
hipótesis nula de raíz unitaria: a = 1

    contraste con constante
    modelo: (1-L)y = b0 + (a-1)*y(-1) + e
    Coef. de autocorrelación de primer orden de e: 0.188
    valor estimado de (a - 1): -0.358226
    Estadístico de contraste: tau_c(1) = -3.54033
    Valor p 0.01041

Regresión de Dickey-Fuller
MCO, usando las observaciones 1949-2003 (T = 55)
Variable dependiente: d_uhat

              Coeficiente   Desv. Típica   Estadístico t   Valor p
  ------------------------------------------------------------------
  const         0.0493861     0.147647         0.3345      0.7393
  uhat_1       -0.358226      0.101184        -3.540       0.0104   **

  AIC: 168.024   BIC: 172.039   HQC: 169.577
```

Dado que no se encuentra una relación de largo plazo contemporáneamente, se plantea la hipótesis de que es la inflación en t-1 la que determina el valor de equilibrio a largo plazo del desempleo en t. Contraste la presencia de cointegración entre ambas variables.

Relación de cointegración



ADF sobre los residuos de la cointegración



El valor del estadístico de DF es –3,75, valor inferior al valor crítico al 1% (-3,55), por lo que rechazamos H0. Esto implica que los errores son estacionarios y por ende las series están cointegradas.

Estime el MCE incluyendo dos retardos de cada una de las variables como regresores. Interprete la salida. Obtenga los residuos y estudie su comportamiento. ¿Son ruido blanco?

gretl: model 4

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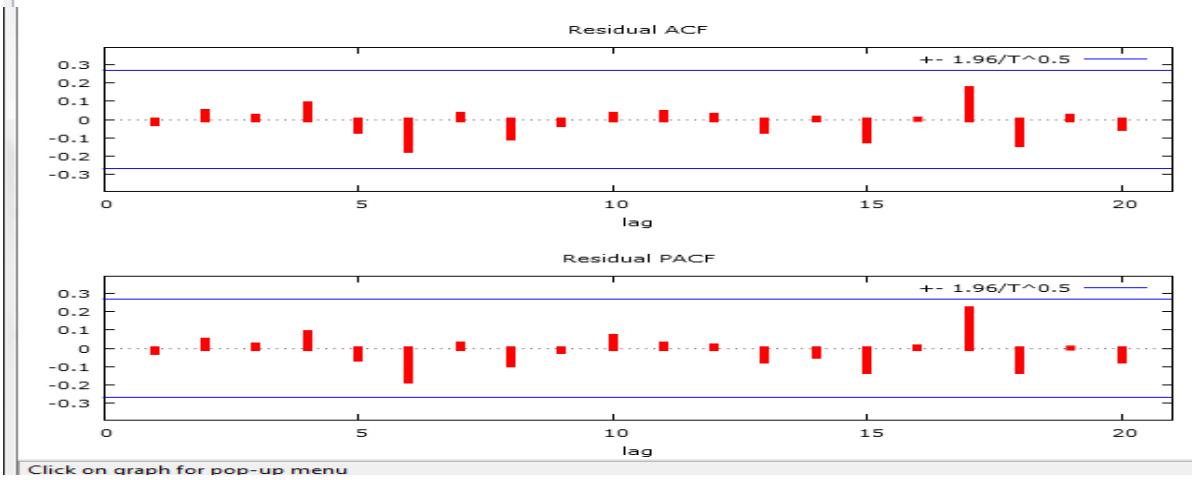
Model 4: OLS, using observations 1951–2003 (T = 53)
Dependent variable: d_unem

	coefficient	std. error	t-ratio	p-value	
const	1.96371	0.549212	3.576	0.0008	***
TCE	−0.422041	0.116140	−3.634	0.0007	***
d_inf_1	0.0894362	0.0661027	1.353	0.1825	
d_inf_2	−0.000251993	0.0625484	−0.004029	0.9968	
d_unem_1	0.191953	0.132963	1.444	0.1555	
d_unem_2	−0.0233699	0.134545	−0.1737	0.8629	

Mean dependent var	0.013208	S.D. dependent var	1.042009
Sum squared resid	37.71125	S.E. of regression	0.895749
R-squared	0.332080	Adjusted R-squared	0.261025
F(5, 47)	4.673550	P-value(F)	0.001520
Log-likelihood	−66.18490	Akaike criterion	144.3698
Schwarz criterion	156.1916	Hannan–Quinn	148.9159
rho	−0.024680	Durbin's h	−0.626539

Excluding the constant, p-value was highest for variable 13 (d_inf_2)



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