

Schatting Okun's law; Nederland, periode 1979-2017

Variabelen

Afhankelijke variabele UD= jaar op jaarmutatie van werkloosheidspercentage.
 Onafhankelijke variabele YGL= jaar op jaargroei BBP, half jaar vertraagd:
 $YGL = 0.5*(YG+YG(-1))$ met YG =procentuele groei BBP.
 Bron: CBS.

Stationariteit van UD en YGL

Nulhypothese wordt niet verworpen

Null Hypothesis: UD has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.514546	0.0047
Test critical values:	1% level		-4.219126	
	5% level		-3.533083	
	10% level		-3.198312	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(UD)				
Method: Least Squares				
Date: 03/18/16 Time: 14:58				
Sample (adjusted): 1980 2017				
Included observations: 38 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
UD(-1)	-0.576561	0.127712	-4.514546	0.0001
D(UD(-1))	0.518032	0.146583	3.534047	0.0012
C	0.126193	0.203506	0.620098	0.5393
@TREND("1979")	-0.004110	0.009058	-0.453791	0.6529
R-squared	0.408042	Mean dependent var		-0.003355
Adjusted R-squared	0.355811	S.D. dependent var		0.760661
S.E. of regression	0.610517	Akaike info criterion		1.950279
Sum squared resid	12.67285	Schwarz criterion		2.122657
Log likelihood	-33.05531	Hannan-Quinn criter.		2.011610
F-statistic	7.812175	Durbin-Watson stat		2.029177
Prob(F-statistic)	0.000425			

Null Hypothesis: YGL has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 3 (Automatic - based on SIC, maxlag=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.601285	0.0442
Test critical values:	1% level		-4.243644	
	5% level		-3.544284	
	10% level		-3.204699	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(YGL)				
Method: Least Squares				
Date: 03/18/16 Time: 15:02				
Sample (adjusted): 1983 2017				
Included observations: 35 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
YGL(-1)	-0.450843	0.125189	-3.601285	0.0012
D(YGL(-1))	0.698196	0.162346	4.300671	0.0002
D(YGL(-2))	-0.394791	0.150884	-2.616512	0.0140
D(YGL(-3))	0.318349	0.158403	2.009742	0.0538
C	1.676736	0.496172	3.379344	0.0021
@TREND("1979")	-0.031639	0.015176	-2.084718	0.0460
R-squared	0.590572	Mean dependent var		0.083806
Adjusted R-squared	0.519981	S.D. dependent var		1.222513
S.E. of regression	0.846999	Akaike info criterion		2.660570
Sum squared resid	20.80481	Schwarz criterion		2.927201
Log likelihood	-40.55998	Hannan-Quinn criter.		2.752611
F-statistic	8.366098	Durbin-Watson stat		1.789314
Prob(F-statistic)	0.000054			

Schatting over gehele periode

Gebruikt in grafiek en tekst.

Dependent Variable: UD				
Method: Least Squares				
Sample: 1979 2017				
Included observations: 39				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
YGL	-0.432765	0.052052	-8.314024	0.0000
C	0.959649	0.134483	7.135839	0.0000
R-squared	0.651348	Mean dependent var		0.078674
Adjusted R-squared	0.641925	S.D. dependent var		0.864236
S.E. of regression	0.517153	Akaike info criterion		1.568966
Sum squared resid	9.895565	Schwarz criterion		1.654277
Log likelihood	-28.59484	Hannan-Quinn criter.		1.599575
F-statistic	69.12300	Durbin-Watson stat		0.972607
Prob(F-statistic)	0.000000			

Schatting over periode vanaf 2002 (gebaseerd op aantal observaties)

Gebruikt in tekst.

Dependent Variable: UD				
Method: Least Squares with Breaks				
Date: 03/18/16 Time: 14:46				
Sample: 1979 2015				
Included observations: 37				
Break type: Fixed number of user-specified breaks				
Break: 2002				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
1979 - 2001 -- 23 obs				
YGL	-0.581076	0.068759	-8.450910	0.0000
C	1.527928	0.207826	7.351950	0.0000
2002 - 2015 -- 14 obs				
YGL	-0.408507	0.087079	-4.691240	0.0000
C	0.685553	0.153164	4.475948	0.0001
R-squared	0.745853	Mean dependent var		0.087183
Adjusted R-squared	0.722748	S.D. dependent var		0.887041
S.E. of regression	0.467068	Akaike info criterion		1.417124
Sum squared resid	7.199048	Schwarz criterion		1.591277
Log likelihood	-22.21680	Hannan-Quinn criter.		1.478521
F-statistic	32.28197	Durbin-Watson stat		1.276352
Prob(F-statistic)	0.000000			

Stabiliteitstoetsen

Nulhypothese (breakpoint in 2002 en 2013) verworpen.

Chow Forecast Test			
Equation: EQ_UD1			
Specification: UD YGL C			
Test predictions for observations from 2002 to 2017			
	Value	df	Probability
F-statistic	1.357465	(16, 21)	0.2524
Likelihood ratio	27.69514	16	0.0344
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	5.031109	16	0.314444
Restricted SSR	9.895565	37	0.267448
Unrestricted SSR	4.864456	21	0.231641
LR test summary:			
	Value	df	
Restricted LogL	-28.59484	37	
Unrestricted LogL	-14.74727	21	
Unrestricted log likelihood adjusts test equation results to account for observations in forecast sample			

Chow Breakpoint Test: 2013			
Null Hypothesis: No breaks at specified breakpoints			
Equation Sample: 1979 2017			
F-statistic	1.745301	Prob. F(2,35)	0.1894
Log likelihood ratio	3.707576	Prob. Chi-Square(2)	0.1566

Schatting met vertraagde endogenen i.v.m. seriële correlatie

Seriële correlatie in residuen verworpen; leidt niet tot significant verschil in geschatte coëfficiënt van YGL.

Dependent Variable: UD				
Method: Least Squares				
Date: 03/18/16 Time: 15:43				
Sample (adjusted): 1980 2017				
Included observations: 38 after adjustments				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
YGL	-0.304049	0.056141	-5.415832	0.0000
C	0.680730	0.165571	4.111413	0.0002
UD(-1)	0.507368	0.096910	5.235462	0.0000
UD(-2)	-0.306608	0.065863	-4.655218	0.0000
R-squared	0.751274	Mean dependent var		0.080617
Adjusted R-squared	0.729327	S.D. dependent var		0.875751
S.E. of regression	0.455620	Akaike info criterion		1.364985
Sum squared resid	7.058041	Schwarz criterion		1.537362
Log likelihood	-21.93471	Hannan-Quinn criter.		1.426315
F-statistic	34.23218	Durbin-Watson stat		1.827362
Prob(F-statistic)	0.000000	Wald F-statistic		21.18811
Prob(Wald F-statistic)	0.000000			