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'/// Eviews program written by Carlos Goes and Rania Papageorgiou
'/// for use at Dr Prakash Loungani's Macroeconometrics course
'/// at Johns Hopkins SAIS

'*** This do file aims at
'**** (a) practicing time-series commands in Eviews
'**** (b) calculating potential Output and Output Gap with the Hodrick-Prescott filter
'**** (c) calculating the Okun's law relationship

cd "U:\Macroeconometrics\Eviews\Output gap"
close outputgap.wf1
wfcreate(wf=outputgap,page=yearly) y 1980 2011

read "outputgap.txt" 6

'// 1. Prepare the data

'// 1a. Take logs of the output and calculate first differences

series ly = log(y)                                          " takes the log of GDP
series dly = d(ly) * 100                                    " calulates GDP growth
series du = d(u) * 100                                      " takes the first difference of unemployment

'// 2. Use Hodrick-Prescott filter of the log of GDP

ly.hpf(lambda=6.25) lytrend @ lycycle

'// 3. Exponentiate calculated trend to obtain the trend in levels

series ytrend = exp(lytrend)                                " exponentiates to get trend in levels

'// 4. Calculate Output Gap

series ygap = ( y / ytrend - 1) * 100

'// 5. Do the same to calculate the natural rate of unemployment and the employment gap

u.hpf(lambda=6.25) utrend @ ucycle
series ugap = ( u / utrend - 1) * 100
```

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'// 6. Plot charts

' *** 6a. for Potential GDP, GDP growth, and Output Gap

graph potential.line  y ytrend                                    " creates a line graph named 'potential'
potential.addtext(t, font(18pt,+b)) "Actual and Potential GDP in Brazil"    " adds the title
potential.setelem(1) legend("Actual GDP")                         " sets legend for element 1
potential.setelem(2) legend("Potential GDP")                      " sets legend for element 2


group g1 ygap dly                                                 " creates a group called 'g1'
graph gap.bar(l) g1                                               " combines a bar and a line graph
gap.setelem(1) legend("Output Gap, in pct")
gap.setelem(2) legend("GDP Growth, in pct")
gap.axis(l) range(-6, 8) zeroline -minor
gap.addtext(t, font(18pt,+b)) "GDP Growth and Output Gap in Brazil"    " adds the title

show gap potential                                                " plots graphs

' *** 6b. for Okun's law

equation okun.ls du c dly                                         " runs du on dly
okun.fit du_hat                                                   " creates fitted values
sort(a) du                                                        " sorts series

group g2 dly du du_hat                                            " creates group
freeze(graph) g2.scat                                             " creates scatterplot
graph.setelem(2) legend("Actual")
graph.setelem(2) symbol(none) linepattern(solid)                  " sets trendline
graph.setelem(3) legend("Fitted")
graph.addtext(t, font(18pt,+b)) "Okun's law in Brazil"            " adds the tile
graph.axis(l) zeroline                                            " adds zero line
graph.axis(x) zeroline                                            " adds zero line

show graph                                                        " plots graph
```