Econometrics with Financial Applications: Workshop Three

1. Download the example workfile from Lutkepol (2007) from Canvas or from:

http://www.eviews.com/EViews8/data/wgmacro.wf1

2. Import the workfile automatically using the new command:

import <yourfilepath> \wgmacro

Adjust the sample range to include all observations with command: smpl @all.

3. Plot the three series in levels, log levels and log first differences using the three pre-generated series in the workfile:

graph tsplot1.line consumption income investment graph tsplot2.line lconsumption lincome linvestment graph tsplot3.line dlconsumption dlincome dlinvestment

- 4. Using the plots, unit root tests (Workshop Two) ({%Series}.uroot) and auto-correlation functions ({%Series}.correl), assess the stationarity of each series.
- 5. Assuming the three series are I(1), estimate a VAR(4) model in log first differences with least squares in the following three ways: 1.) Select all three $variables \rightarrow Open \rightarrow As\ VAR$, 2.) $Object \rightarrow New\ Object \rightarrow VAR$ and type in your three endogenous variables (dlincome, dlinvestment, dlconsumption) with lag lengths 1 4 (why?), 3.) In the command window:

var var1.ls 1 4 dlincome dlinvestment dlconsumption

6. Lets now consider the number of lags to use: View→Lag Structure→Lag Length Criteria and then re-estimate the model using the preferred lag length:

var1.laglen(8)

var var1.ls 1 2 dlincome dlinvestment dlconsumption

See the accompanying program for how to do write a script to determine and estimate a var model with a suitable lag length.

7. Lets now test for block-exogenity and Granger Causality. Using the inbuilt EViews menus: $View \rightarrow Lag\ Structure \rightarrow Granger\ Causality/Block\ Exogeneity$. Alternatively, you can use:

var1.testexog

How do we interpret these results? What can we conclude?

- 8. Lets check our results by doing individual Wald tests. This is more tricky. We have to make the VAR into a system then estimate it by OLS: $Proc \rightarrow Make\ System \rightarrow Order\ by\ Variable \rightarrow Proc \rightarrow Estimate \rightarrow View \rightarrow Coefficient\ Diagnostics \rightarrow Wald\ Coefficient\ Tests$. Test out some restrictions which correspond to the block-exogenity and Granger Causality tests which you undertook on the VAR in menus can you get the same numbers? For command line/programming guidance on this see the program on the following page.
- Finally, estimate the impulse responses to each variable from a shock from each other variable by using the menus: View→Impulse Response, or by using the command line:

 $\begin{tabular}{ll} var1.impulse (10,m,a,se=a) & dl consumption & dlincome & dlinvestment & dlincome &$

How do we interpret the results form this?

10. Optional Homework: Change the impulse defintions and the orderings to see how the effects change.

Program for Workshop Three

```
import c:\wgmacro
!maxvarlags=4
matrix(3,!maxvarlags) ic_mat
graph tsplot1.line consumption income investment
graph tsplot2.line lconsumption lincome linvestment
graph tsplot3.line dlconsumption dlincome dlinvestment
rename dlconsumption dlcons
rename dlincome dlinc
rename dlinvestment dlinv 'rename due to EViews 24 character limit
for %series dlcons dlinc dlinv
   for %test adf kpss
       for %det const trend
           freeze({\%series}_{-}{\%det}_{-}{\%test}_{-}d0) {\%series}_{-}uroot({\%test}_{-}{\%det}_{-}dif=0)
           freeze(\{\%series\}_{\{\%det\}_{\{\%test\}_{d}1\}}, \{\%series\}_{uroot}(\{\%test\}_{,\{\%det\}_{d}if=1\}))
           freeze(\{\%series\}\_\{\%det\}\_\{\%test\}\_d2)\ \{\%series\}.uroot(\{\%test\},\{\%det\},dif=2)
       next
   next
   freeze({%series}_d0) {%series}.correl
   freeze({\%series}_d1) d({\%series}_1).correl
   freeze({\%series}_d2) d({\%series}_2).correl
for !p = 1 to !maxvarlags
   var var!p.ls 1 !p dlcons dlinc dlinv
   !iccounter=1
   for %IC aic schwarz hq
       ic_mat(!iccounter,!p)=var1.@{%IC}
       if var\{!p\}.@\{\%IC\}<!\{\%IC\} then
           !bestlag{\%IC}=!p
           !{\%IC}=var{!p}.@{\%IC}
       endif
   !iccounter = +!iccounter + 1
   next
next
var varaic.ls 1 !bestlagaic dlcons dlinc dlinv
var varschwarz.ls 1 !bestlagschwarz dl<br/>cons dlinc dlinv
var varhq.ls 1 !bestlaghq dlcons dlinc dlinv
varaic.laglen(8)
varaic.testexog
varaic.makesystem(n=varsystem)
varsystem.ls
varsystem.wald c(3)=c(4)=0 'granger causality test
varsystem.wald c(3)=c(4)=c(5)=c(6)=0 'block exogeneity test
varaic.impulse(10,m,a,se=a) dlcons dlinc dlinv @ dlcons dlinc dlinv
```