***EViews* Exercises for Chapter 15**

**EXAMPLE 15.2: A VECM representation of U.K. long and short interest rates**

On opening the workfile interest\_rates.wf1, open r20 and rs as a group and click ***Open Var…***. On estimating the default VAR(2) with c included as an exogenous variable, click ***View/Lag Structure/Lag Length Criteria…*** and change the ‘Lags to include’ to 6. This will then produce the material for Table 15.1.

Clicking ***Estimate*** and changing the ‘Lag Intervals to Include’ to ‘1 3’ will estimate the VAR(3). Clicking ***View/Cointegration Test…*** and retaining option 3 as the ‘Deterministic trend assumption of test’ will produce the reported cointegration test statistics. Now click ***Estimate***, check ‘Vector Error Correction’ for VAR type and then change ‘Lag Intervals for D(Endogenous)’ to ‘1 2’. Clicking ***Cointegration*** and choosing option 2 as the ‘Deterministic trend assumption of test’ will estimate the reported VECM.

**EXAMPLE 15.3 Tests on the VECM of U.K. interest rates**

To impose and test restrictions on the VECM, click ***Estimate/VEC Restriction***, check ‘Impose Restriction’ and enter

b(1,1) = 1, b(1,2) = -1, a(1,1) = 0

in the restrictions box.

Forecasts may be obtained in the usual way after extending the range of the sample out to end-2020 (recall the examples of Chapter 7).

**EXAMPLE 15.4: A structural VECM for U.K. interest rates**

To estimate a structural VECM, click ***Proc/Make System/Order by lag*** and the following ‘system’ is then shown

d(r20) = c(1)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(2)\*d(r20(-1)) + c(3)\*d(rs(-1)) + c(4)\*d(r20(-2)) + c(5)\*d(rs(-2))

d(rs) = c(6)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(7)\*d(r20(-1)) + c(8)\*d(rs(-1)) + c(9)\*d(r20(-2)) + c(10)\*d(rs(-2))

To impose the identification condition that d(r20) does not appear in the d(rs) equation, add ‘+ c(11)\*d(rs)’ to the d(r20) equation, i.e.,

d(r20) = c(1)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(2)\*d(r20(-1)) + c(3)\*d(rs(-1)) + c(4)\*d(r20(-2)) + c(5)\*d(rs(-2)) + c(11)\*d(rs)

Clicking ***Estimate*** will then estimate the structural VAR. Clicking ***View/Coefficient/Wald Coefficient Tests*** and entering c(5) = c(9) = c(10) = 0 into the restrictions box will produce a test of these zero restrictions on the three insignificant coefficients. Clicking ***Spec*** and then editing the specification to

d(r20) = c(1)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(2)\*d(r20(-1)) + c(3)\*d(rs(-1)) + c(4)\*d(r20(-2)) + 0\*d(rs(-2))

d(rs) = c(6)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(7)\*d(r20(-1)) + c(8)\*d(rs(-1)) + 0\*d(r20(-2)) + 0\*d(rs(-2))

will then impose these restrictions. The alternative identification condition in which d(rs) does not appear in the d(r20) equation may be imposed by following an analogous procedure.

**EXAMPLE 15.5 LA-VAR causality tests for U.K. interest rates**

These may be obtained by fitting a VAR(4) with constant included to the group rs and r20 and testing for Granger causality in the usual way.

**EXAMPLE 15.6: Impulse responses from the interest rate VECM**

These may be obtained from the fitted VECM in the usual way.

**EXAMPLE 15.7: A VECM-X model of temperature and total radiative forcing**

Open the workfile global\_forcings.wf1, click ***Quick/Estimate VAR…***. and check ‘Vector Error Correction’. Enter temp trf in the ‘Endogenous variables’ box, ‘1 4’ in the ‘Lag intervals for D(Endogenous)’ box and volc soi amo amo(-1) in the ‘Exogenous variables’ box. Click ***Cointegration*** and choose option 5 to estimate the model.

Now click ***Proc/Make System/Order by variable*** to obtain the system

d(temp) = c(1)\*( temp(-1) - 0.418005968853\*trf(-1) - 9.37295057798e-05\*@trend(66) + 0.114629966516 ) + c(2)\*d(temp(-1)) + c(3)\*d(temp(-2)) + c(4)\*d(temp(-3)) + c(5)\*d(temp(-4)) + c(6)\*d(trf(-1)) + c(7)\*d(trf(-2)) + c(8)\*d(trf(-3)) + c(9)\*d(trf(-4)) + c(10) + c(11)\*@trend(66) + c(12)\*volc + c(13)\*soi + c(14)\*amo + c(15)\*amo(-1)

d(trf) = c16)\*( temp(-1) - 0.418005968853\*trf(-1) - 9.37295057798e-05\*@trend(66) + 0.114629966516 ) + c(17)\*d(temp(-1)) + c(18)\*d(temp(-2)) + c(19)\*d(temp(-3)) + c(20)\*d(temp(-4)) + c(21)\*d(trf(-1)) + c(22)\*d(trf(-2)) + c(23)\*d(trf(-3)) + c(24)\*d(trf(-4)) + c(25) + c(26)\*@trend(66) + c(27)\*volc + c(28)\*soi + c(29)\*amo + c(30)\*amo(-1)

After estimation, the various sets of restrictions may be tested by clicking ***View/Coefficient/Wald Coefficient Tests*** and entering the following sets in succession:

c(6) = c(7) = c(8) = c(9) = 0

c(17) = c(18) = c(19) = c(20) = 0

c(27) = c(28) = c(29) = c(30) = 0

The complete set of restrictions is

c(6) = c(7) = c(8) = c(9) = c(17) = c(18) = c(19) = c(20) = c(27) = c(28) = c(29) = c(30) = c(11) = c(5) = 0

To estimate the restricted model the specification can then be edited by replacing all these coefficients with zeros as above.

**EXAMPLE 15.8: Is there are common cycle in U.K. interest rates?**

Make the structural VECM system as in Example 15.4 with the identification restriction that d(rs) does not appear in the d(r20) equation:

d(r20) = c(1)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(2)\*d(r20(-1)) + c(3)\*d(rs(-1)) + c(4)\*d(r20(-2)) + c(5)\*d(rs(-2))

d(rs) = c(6)\*( r20(-1) - 1\*rs(-1) - 1.19059752289 ) + c(7)\*d(r20(-1)) + c(8)\*d(rs(-1)) + c(9)\*d(r20(-2)) + c(10)\*d(rs(-2)) + c(11)\*d(r20)

The common cycle restrictions are then

c(6) = c(7) = c(8) = c(9) = c(10) = 0

which may be tested in the usual way.