```
1   * We first rename all the variables in order to make our lives easier.
2   import excel "C:\Users\Emmanuel\Documents\Thesis Master Folder\Master Data Set-Final
    Draft.xlsx", sheet("Sheet1") firstrow
3   drop Q
4   drop R
5   mlabel Finalconsumptionexpenditureof
6   mlabel( Finalconsumptionexpenditureof)
7   rename Governmentspendingaspercento Gov_Spending%
8   rename Governmentspendingaspercento Gov_Spending_Pct_GDP
9   rename Finalconsumptionexpenditureof Expenditure_General_Govt
10  rename Foreigndirectinvestmentneti FDI
11  rename Foreignexchangereservesinclud Forex_Reserves
12  rename Exportsofgoodsandservices Exports Pct GDP
13  rename Exportsofgoodsandservicesat Exports Euro
14  rename Netexportsofgoodsandservice Trade_Bal_Euro
15  rename Grossdomesticproductatcurren GDP
16  rename L GDPpc
17  *We transform the euro denominated variables into logs.Reason:If the distribution of a
    variable has a positive skew, taking a natural logarithm of the variable sometimes hel
    fitting the variable into a model.
18  *Log transformations make positively skewed distribution more normal.
19  *Also, when a change in the dependent variable is related with percentage change in ar
    independent variable, or vice versa, the relationship is better modeled by taking the
    natural log of either or both of the variables.
20  gen ln_TaxesCashCenGovtBillion=ln(TaxesCashCenGovtBillion)
21  gen ln_Expenditure_General_Govt=ln( Expenditure_General_Govt)
22  gen ln_FDI=ln(FDI)
23  gen ln Forex Reserves=ln( Forex Reserves)
24  gen ln Exports Euro=ln( Exports Euro)
25  *save "C:\Users\Emmanuel\Documents\Thesis Master Folder\Master data file.dta", replace
26  *file C:\Users\Emmanuel\Documents\Thesis Master Folder\Master data file.dta saved
27  gen ln_GDP=ln(GDP)
28  gen ln_GDPpc=ln(GDPpc)
29  gen ln_Privatefinalconsumptionexpend=ln(Privatefinalconsumptionexpend)
30  *(1 variable, 42 observations pasted into data editor)
31  *(1 variable, 41 observations pasted into data editor)
32  rename var25 Trade_Balance_Pct_GDP
33  destring, replace

34  tsset Year
35  *Performing a unit root test for each variable
36  dfuller ln_Total_Tax_Revenue ,noconstant
37  dfuller dln_Total_Tax_Revenue ,noconstant
38  dfuller Gov Spending Pct GDP ,noconstant
39  dfuller dGov Spending Pct GDP ,noconstant
40  dfuller ln_PrivtCons_Exp , trend
41  dfuller dln_PrivtCons_Exp , trend
42  dfuller ln_GDPpc ,trend
43  dfuller dln_GDPpc ,trend
44  dfuller ln_Exports_Euro , trend
45  dfuller dln Exports Euro , trend
46  dfuller ln Exports Euro , noconstant
47  dfuller dln_Exports_Euro ,noconstant
48
49
50
51  ******************************************************
52
53  set matsize 800
54
55  ************************************************
56
57  *Investigating for ideal number of lags for the first VAR which contains 5 variables,
    three of them domestic response macroeconomic variables
58  varsoc dGov_Spending_Pct_GDP dln_GDPpc dln_PrivtCons_Exp dUnemployment dTaxrevenueofGDP,
    maxlag(4)
59  *The answer once again appears to be 1 lag
60  varbasic dUnemployment dln_PrivtCons_Exp dln_GDPpc dTaxrevenueofGDP dGov_Spending_Pct_GDP,
    lags(1) step(5) irf
61  varnorm, jbera
```

```
62  * This implies (assumption) that innovations and drastic changes to Gov.spending are
    completely responsible for the shared component of error terms in all variables.
63  *Basically spending influences GDP pc, consumption,unemployment and taxation.
64  *This is an assumption that also been the common trend in Greece after the rise of PASOK
    to prominence in the early 80's
65  * Increased gov spending, government purchases and excess public sector hiring have made
    the greek government the larger employer in the country.
66  * Lets attept to perform a vector error correction model with cointegrating variables
67  *After properly fitting the VECM the irf commands can be used to obtain IRFs and
68  *forecast error variance decomposition
69
70  * Table command
71  outreg2 using table1.xls, dec(4) bdec(4) addtext(AAA) title(OLA) replace
72
73
74  ***************First VAR(5Variables)*******************
75
76  ***We keep changing the ordering in the VAR in order to capture a cholesky decomposition
77  *that places government spending in a contemporaneously endogenous position. This appears
    to be the best option
78
79  var dUnemployment dln_PrivtCons_Exp dln_GDPpc dln_Total_Tax_Revenue dGov_Spending_Pct_GDP,
     lags(1)
80  irf create grtest1,set(grtest1,replace) step(5) order(dUnemployment dln_PrivtCons_Exp
    dln_GDPpc dln_Total_Tax_Revenue dGov_Spending_Pct_GDP)
81  irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov_Spending_Pct_GDP) response(
    dUnemployment) yline(0)
82  irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov Spending Pct GDP) response(
    dln PrivtCons Exp) yline(0)
83  irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov_Spending_Pct_GDP) response(dln_GDPpc
    ) yline(0)
84  irf graph oirf,set(grtest1) irf(grtest1) impulse(dln_Total_Tax_Revenue) response(
    dUnemployment) yline(0)
85  irf graph oirf,set(grtest1) irf(grtest1) impulse(dln_Total_Tax_Revenue) response(
    dln PrivtCons Exp) yline(0)
86  irf graph oirf,set(grtest1) irf(grtest1) impulse(dln Total Tax Revenue) response(dln GDPpc
    ) yline(0)

87
88  ***********************************************************************
89
90
91  * This implies (assumption) that innovations and drastic changes to Gov.spending is
    completely responsible for the shared component of error terms in all variables.
92  * Basically spending influences GDP pc, consumption,unemployment and taxation.
93  * This is an assumption that also been the common trend in Greece after the rise of PASOK
    to prominence in the early 80's
94  * Increased gov spending, government purchases and excess public sector hiring have made
    the greek government the larger employer in the country.
95
96  **** Changing the tax variable to total tax revenue since tax as a percentage of GDP
    gives us no significance whatsoever.
97  **** Also changing dUnemployment to Unemployment since the orginal dfuller test in
    Unemployment did not show the existence of a unit root
98
99  varsoc Unemployment dln_PrivtCons_Exp dln_GDPpc ln_Total_Tax_Revenue dGov_Spending_Pct_GDP
    ,maxlag(4)
100 *The answer once again appears to be 1 lag
101 varbasic Unemployment dln PrivtCons Exp dln GDPpc ln Total Tax Revenue
    dGov Spending Pct GDP,lags(1) step(5) irf
102 varnorm, jbera
103 ***We change the ordering in the VAR in order to capture a cholesky decomposition
104 *that places tax revenue in a contemporaneously endogenous position. This appears to be
    the best option
105 var Unemployment dln_PrivtCons_Exp dln_GDPpc dGov_Spending_Pct_GDP ln_Total_Tax_Revenue,
    lags(1)
106 irf create grtest1,set(grtest1,replace) step(5) order(Unemployment dln PrivtCons Exp
    dln_GDPpc dGov_Spending_Pct_GDP ln_Total_Tax_Revenue)
107 irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov_Spending_Pct_GDP) response(
    Unemployment) yline(0)
```

```
irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov_Spending_Pct_GDP) response(dln_PrivtCons_Exp) yline(0)
irf graph oirf,set(grtest1) irf(grtest1) impulse(dGov_Spending_Pct_GDP) response(dln_GDPpc) yline(0)
irf graph oirf,set(grtest1) irf(grtest1) impulse(ln Total Tax Revenue) response(Unemployment) yline(0)
irf graph oirf,set(grtest1) irf(grtest1) impulse(ln_Total_Tax_Revenue) response(dln_PrivtCons_Exp) yline(0)
irf graph oirf,set(grtest1) irf(grtest1) impulse(ln_Total_Tax_Revenue) response(dln_GDPpc) yline(0)
**********************
outreg2 using table1.xls, dec(4) bdec(4) addtext(AAA) title(Five Variable VAR (1974-2013)) replace


******Significance rose with the selection of the alternative tax variable which is expressed in Euros instead of a percentage of GDP****


*We rerun the dynamic forecasts. Let's restrict the sample so we can generate ex-poste out of sample forecasts and re run the VAR.
var Unemployment dln_PrivtCons_Exp dln_GDPpc ln_Total_Tax_Revenue dGov_Spending_Pct_GDP, lags(1 2 3)
quietly var Unemployment dln_PrivtCons_Exp dln_GDPpc ln_Total_Tax_Revenue dGov_Spending_Pct_GDP if Year<2007, lags(1 2 3)
fcast compute F_, step(14)
fcast graph F_ln_Total_Tax_Revenue
fcast graph F_dGov_Spending_Pct_GDP
fcast graph F_dln_GDPpc
fcast graph F_Unemployment

****
set level 90


**************************Second VAR***********************************************


varsoc dln_GDPpc ln_Exports_Euro dGov_Spending_Pct_GDP ln_Total_Tax_Revenue, maxlag(4)
varbasic dln_GDPpc ln_Exports_Euro dGov_Spending_Pct_GDP ln_Total_Tax_Revenue, lags(1) step(5) irf
var dln_GDPpc ln_Exports_Euro dGov_Spending_Pct_GDP ln_Total_Tax_Revenue, lags(1)
irf create grtest4,set(grtest4,replace) step(5) order(dln_GDPpc dGov_Spending_Pct_GDP ln_Exports_Euro ln_Total_Tax_Revenue)
irf graph oirf,set(grtest4) irf(grtest4) impulse(dGov_Spending_Pct_GDP) response(ln_Exports_Euro) yline(0)
irf graph oirf,set(grtest4) irf(grtest4) impulse(dGov_Spending_Pct_GDP) response(dln_GDPpc) yline(0)
irf graph oirf,set(grtest4) irf(grtest4) impulse(ln_Total_Tax_Revenue) response(ln_Exports_Euro) yline(0)
irf graph oirf,set(grtest4) irf(grtest4) impulse(ln_Total_Tax_Revenue) response(dln_GDPpc) yline(0)
outreg2 using table2.xls, dec(4) bdec(4) addtext(The results of the table above are coefficients of the level of correlation between all variables and their lags. The optimal number of lags that minimizes the majority of the system's Information Criteria is one single lag.) title(Four Variable VAR) replace


*****************************VECM Model**********************************
*After properly fitting the VECM the irf commands can be used to obtain IRFs and
*forecast error variance decomposition

varsoc Unemployment ln_PrivtCons_Exp ln_GDPpc ln_Total_Tax_Revenue Gov_Spending_Pct_GDP, maxlag(4)
vecrank Unemployment ln_PrivtCons_Exp ln_GDPpc ln_Total_Tax_Revenue Gov_Spending_Pct_GDP
vecrank Unemployment ln_PrivtCons_Exp ln_GDPpc ln_Total_Tax_Revenue Gov_Spending_Pct_GDP, lags(4)
vec Unemployment ln_PrivtCons_Exp ln_GDPpc ln_Total_Tax_Revenue Gov_Spending_Pct_GDP,lags(4)rank(1)
```

```
155   vecstable,graph
156   vecnorm
157   veclmar
158
159   outreg2 using table4.xls, dec(4) bdec(4) addtext(The results of the table above are
      coefficients of the level of correlation between all variables and their lags. The optimal
       number of lags that minimizes the majority of the system's Information Criteria is two
      lags.) title(Five Variable VECM) replace
160   predict ce1,ce equ(#1)
161   twoway line ce1 Year
162   irf create vectest1,set(vectest1,replace) step(5)
163   irf graph oirf,set(vectest1) irf(vectest1) impulse(Gov_Spending_Pct_GDP
      ln Total Tax Revenue) response(Unemployment) yline(0)
164   irf graph oirf,set(vectest1) irf(vectest1) impulse(Gov Spending Pct GDP
      ln_Total_Tax_Revenue) response(ln_PrivtCons_Exp) yline(0)
165   irf graph oirf,set(vectest1) irf(vectest1) impulse(Gov_Spending_Pct_GDP
      ln_Total_Tax_Revenue) response(ln_GDPpc) yline(0)
166
167
168   ********** Perform the VECM on the second VAR which includes
      exports.**********
169
170
171   varsoc ln_Total_Tax_Revenue ln_Exports_Euro ln_GDPpc Gov_Spending_Pct_GDP, maxlag(4)
172   *** We indentify that the optimal number of lags is two according to all the information
      criteria.............
173   vecrank ln_Total_Tax_Revenue ln_Exports_Euro ln_GDPpc Gov_Spending_Pct_GDP
174   vecrank ln Total Tax Revenue ln Exports Euro ln GDPpc Gov Spending Pct GDP,lags(2)
175   vec ln Total Tax Revenue ln Exports Euro ln GDPpc Gov Spending Pct GDP,lags(2)rank(1)
176
177   outreg2 using table6.xls, dec(4) bdec(4) addtext(The results of the table above are
      coefficients of the level of correlation between all variables and their lags. The optimal
       number of lags that minimizes the majority of the system's Information Criteria is two
      lags.) title(Five Variable VECM) replace
178
179   vecstable,graph
180   predict ce1,ce equ(#1)
181   twoway line ce1 Year
182   irf create vectest2,set(vectest2,replace) step(5)

182   irf create vectest2,set(vectest2,replace) step(5)
183   irf graph oirf,set(vectest2) irf(vectest2) impulse(Gov_Spending_Pct_GDP
      ln_Total_Tax_Revenue) response(ln_Exports_Euro) yline(0)
184   irf graph oirf,set(vectest2) irf(vectest2) impulse(Gov_Spending_Pct_GDP
      ln Total Tax Revenue) response(ln GDPpc) yline(0)
185
186
187
188   outreg2 using table1.xls, dec(4) bdec(4) addtext(The results of the table above are
      coefficients of the level of correlation between all variables and their lags. The optimal
       number of lags that minimizes the majority of the system's Information Criteria is one
      single lag.) title(Four Variable VAR) replace
189
190
191
```