

UNIVERSITY OF ROCHESTER

William E. Simon Graduate School of Business Administration

APS 425
Advanced Managerial Data Analysis
Spring 2012

Professor G. William Schwert
CS3-110L, 585-275-2470
Fax: 585-461-5475
email: schwert@schwert.simon.rochester.edu

Eviews Tutorial

1. Creating a Workfile:

First you need a **Workfile** to work on. In the Workfile, you can store your data and any output you will generate. A new Workfile can be created as follows:

File → New → Workfile

You must specify the frequency of the data. In our example, there are observations ranging from 1960 to 1969. Then, set the Workfile frequency as follows:

	<u>S</u> tart observation	<u>E</u> nd observation
<u>A</u> nnual	1960	1969

If the observations were with some other frequency, you will have to specify it accordingly. For example:

	<u>S</u> tart observation	<u>E</u> nd Observation
<u>M</u> onthly	1960:01	1969:12
<u>Q</u> uarterly	1960:01	1969:04

If you are using cross-sectional data, choose the Workfile frequency as **Undated or irregular** and in the window marked **End Observation** enter the number of observations in the cross-section.

Once you have entered the frequency information, click on the **OK** button. At this point, EViews will open a new window **WORKFILE: Untitled** that contains only two elements: a

constant called c and a series called *resid*, which will be updated after every model you estimate. Before you have estimated any models, the two series will be empty. Note that the icon to the left of each element in the workfile tells you what type of object you have.

2. Importing Data:

Often you will need to import the contents of a text-ASCII file into EViews. You can do that as follows:

File → Import → Read Text-Lotus-Excel...

Find the file you need to import and double-click on it. EViews will open a new window **ASCII Text Import**. In the box marked as **Names for series or number of series** enter the number of columns in the original text file (**4** in our case). The series you have imported from the text file will appear in the Workfile window with their respective names. Note that each series has been imported as an individual element in the Workfile.

3. Saving a Workfile:

To save a workfile in Eviews format, click on the **Save** button at the top of the Workfile window. EViews will prompt you for a file name and it will display the name of the file on the Workfile window. Note that the extension of the file is **.wf1**.

4. Plotting Data with Descriptive Statistics:

To plot data and see the descriptive statistics, select the corresponding series in the Workfile and double-click on it. The series will pop up in a new window in a spreadsheet format. In the new window click **View** and select the type of graph you want. To see the mean, standard deviation, etc. of the series you can do the following:

View → Descriptive Statistics → Histogram and Stats

You can print the window containing the descriptive statistics by clicking on the **Print** button. If you want to look at the series again, select **View** → **S**preadSheet.

5. Creating New Series from Existing Series:

You can use a formula to generate a new series from an existing one by clicking on the **Genr** button in the Workfile window. A new window will appear asking you for the equation formula. You can use ordinary mathematical notation to describe the new series. For example, the series *cons* and *income* in our Workfile are in nominal terms. To transform them in real terms, you can create new series as follows:

$$\begin{aligned} rcons &= cons/cpi \\ rincome &= income/cpi \end{aligned}$$

where *rcons* and *rincome* are the names of the new series. The new series will appear in the workfile.

You can also create lagged values of the existing series. For example, to create the one-period lagged value of *rcons*, simply specify a new variable as:

$$lagrcons = rcons(-1).$$

Here are some common expressions you will need to create new series:

<u>Expression</u>	<u>Operator</u>
+	add
-	subtract
*	multiply
/	divide
^	raise to power

<u>Function</u>	<u>Name</u>
abs(x)	absolute value of x
exp(x)	exponential, e^x
inv(x)	reciprocal, $1/x$
log(x)	natural logarithm of x

6. Working with Several Series:

You can create a **Group** to work with several series together. The Group will contain only the series that you want to work with. That can be done in the Workfile window as follows:

Objects → New Object... → **Group → **OK****

A new window will appear in which you can type the names of the series you want to include in the group. For example, you can create a group consisting of the series *rincome* and *rcons* only. When you click **OK** the group will appear in a spreadsheet format. To save the group in the Workfile, click on the **Name** button in the group window and choose a name. Close the group. The name of the new group will appear in the Workfile. Once the group is created, you can double-click on it and the group window will appear in a spreadsheet format. Click on the **View** button to generate different graphs or statistics. For example,

View → Correlations

will give you the sample correlation matrix of the series *rincome* and *rcons* and

View → Graph → Scatter → Simple Scatter

will give you a scatter of the different combinations of income and consumption.

7. Deleting Series from the Workfile:

To delete a series from the Workfile, click once on the series so that it is highlighted. Then, click on the **Delete** button. EViews will ask you again if you want to delete the corresponding series. Once you click **Yes**, the series will disappear from the Workfile.

8. Running Regressions:

Suppose you want to run a regression of *rcons* (dependent variable) on *rincome* (independent variable) and a constant. You can do that in the Workfile window as follows:

Objects → New Object... → **Equation → **OK****

A new window will appear. In the upper field, enter the name of the dependent variable first, followed by the regressors (the independent variables), separated by a space (for example: ***rcons c rincome***, where *c* always denotes the constant in EViews). Choose your estimation settings (for example, you can leave them as the default choice—LS-Least Squares). You can also choose the sample range that you wish to use (the default is all the observations in the Workfile). Click **OK** to estimate the specified regression model. The equation window with regression output will appear. To save it in the Workfile, click the **Name** button and give it a name. The estimated equation will appear as a new object in the Workfile.

Most of the statistical information related to a regression is reported in the EViews equation window. General information concerning the regression is printed in the top few lines: the name of the dependent variable (**RCONS**), the regression method used (**Least Squares**), the date and time the regression was executed, the sample range (**1960 1969**), and the number of included observations (**10**).

The coefficient statistics are reported in a table format in the equation window. The first column identifies each variable (**C** for the constant and **RINCOME** for the income in real terms). The second and third columns report the estimated coefficient values and their standard errors, respectively. The t-statistic and its p-value are contained in columns four and five, respectively. Note that the reported t-statistic corresponds to the default test of whether the associated coefficient is equal to zero.

Some summary statistics are reported below the regression output:

- a) **R²**: this is the fraction of the variance of the dependent variable explained by the independent variable.
- b) **\bar{R}^2** : adjusted **R²**, measure of fit of the estimated model.
- c) **S.E. of regression**: standard error of the regression.
- d) **Sum squared resid**: OLS selects the value of the coefficients to minimize this.
- e) **Log likelihood**: useful in hypothesis testing.
- f) **Durbin-Watson stat**: test statistic for serial correlation in the residuals.
- g) **Mean dependent var**: measure of central tendency for the dependent variable.
- h) **S.D. dependent var**: measure of dispersion for the dependent variable.
- i) **Akaike info criterion**: used in model selection.
- j) **Schwarz criterion**: used in model selection.

- k) **F-statistic**: tests the hypothesis that all the slope coefficients (excluding the constant) in a regression are equal to zero.
- l) **Prob (F-statistic)**.

When you run the regression, the residuals will be saved in the *resid* series in the Workfile. If you want to keep the residuals for further analysis you can give them a new name by double-clicking on the series and then going to the **Name** button.

Multiple regressions are executed the same way and their output is identical.

To look at a table of the actual values of the dependent variable, the fitted values, and the residuals, you can do the following in the equation window:

View → **Actual,Fitted,Residual** → **Actual,Fitted,Residual Table**

If you want to look at the regression output again, select **View** → **Estimation Output**.

When you use time series data, you will sometimes need to analyze the residuals from the regression. You can use the **View** button in the equation window to do that. For example, to obtain the autocorrelation function of the residuals, you can do the following:

View → **Residual Test** → **Correlogram-Q-statistics**

EViews will ask you for the number of lags that you want to include. After you have specified that, EViews will show you the autocorrelation function (**AC**), the partial autocorrelation function (**PAC**), the Box-Ljung Q statistic (**Q-stat**) and its p-value.

Suppose you want a prediction of consumption for the period from 1965 to 1969, given the values of consumption you have for the period from 1960 to 1964. First, you need to have the values of income for the period 1965-1969. Then, you need to estimate the regression model for the period from 1960 to 1964. To do that, double-click on the equation you estimated before to open it. In the **Sample** window change the range of the sample by typing **1960 1964**. Click **OK** to estimate the regression for the newly specified period. In the new equation window you can forecast consumption for the period from 1965 to 1969 by clicking on the **Forecast** button. A new window will appear in which you can indicate the name of the new series in which you want to store the forecast values of consumption. You can also store the standard errors of the forecasts (this is not required, however). You also need to indicate for which time periods you need the forecast (in this example, **1965 1969**).

9. Help Menu

To get further information on EViews, you can select **H**elp → **E**VIEWS **H**elp **T**opics → **I**ndex. Then, you can type the name of the subject you are interested in.