Introduction Eviews for Orientation course Econometrics

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Abstract

This document provides a short hands-on introduction to the main features of the Eviews-software version 5, 4 (and 3). Exercises are provided in a separate document. This document is not perfect. Corrections, comments and questions are very welcome.

Acknowledgement This introduction is partly extracted from Vogelvang (2005).

Contents

1 Introduction

This Eviews-introduction is part of the material for a basic course in Econometrics. It should be used together with a copy of the Eviews software, a textbook and the corresponding datasets. The datasets will be made available to all students via the computer network.

Since Eviews, "Econometric Views" is widely used in the Econometrics curriculum and numerical examples in econometric textbooks are often based on Eviews results, we have chosen the package for this course.

During the course the student has to make a number of computer exercises in order to understand the methods in practice. EViews 4 is used to solve the exercises. The faculty of Economics has a student licence for EViews 2.0, so EViews can be used at home too. This lower level of EViews does not present major problems for this course. Eviews 2.0 is an older program and does not always work well with long directory names and file names. So you may have to change the names of some folders and files at home. A more recent version of Eviews (3.1) for students is available for use at home for 30 Euro. Ask the teacher. Eviews 5 has become available in 2004, but Eviews 4 commands should continue to work also in Eviews 5. A student version of Eviews 5 is not available.

Eviews and its documentation are only available in English. The Faculty of Economics also employs English versions of the Windows operating system. That is why we have not attempted to write this introduction in Dutch. Please look up English words in the documentation that you really don't understand. After following the instructions in this document hands-on, you should be able to learn the operation of other procedures in Eviews more easily.

1.1 Intranet and Internet

This text and corresponding data and procedures will be available in different formats in on the internet site:

`http://www.feweb.vu.nl/econometriclinks/orientatie`

An extensive list of econometric links is permanently available on

`http://econometriclinks.com` or `http://www.feweb.vu.nl/econometriclinks`

It provides links to (collections) of online datasets, code, journals, textbooks and more. In particular

`http://www.feweb.vu.nl/econometriclinks/software.html`

presents an up-to-date list of links to econometric and statistical software packages, with links to different freely available Eviews tutorials.

The Department of Econometrics of the Free University has its site on

`http://www.feweb.vu.nl/ectrie/`

The Eviews homepage is at

`http://www.eviews.com`

This is a very useful site, as software upgrades can be downloaded freely from its download section.

2 The software EViews

2.1 Introduction

EViews, Econometric Views, is described in this text. Eviews is a widely used program in education, government and industry. It originated from the program TSP, Time Series Processor, `http://www.tspintl.com`. Nowadays, Eviews and TSP coexist, with Eviews specializing in user-friendliness and TSP specializing in speed, scientific documentation and numerical accuracy.

Originally intended for time series data, Eviews is now also fit for the analysis of cross-section data and panel data. Eviews provides most standard econometric techniques. The Eviews-terminology for its procedures follows the standard of most Econometrics' textbooks. This terminology may differ slightly from the standard statistics-terminology. Moreover, some standard statistics' procedures like the BoxPlots, are not (yet) implemented in Eviews 4.

EViews produces pictures and tables that can easily be imported in word processing systems like Word, Scientific WorkPlace or MikTex.

2.2 EViews Basics

Eviews is started and closed like other Windows-programs. In a standard installation you will find it via the Window Start-Menu on the bottom of your screen, for example via *Start-Programs-Eviews-Eviews 4*. The *Main Eviews Window* will pop up. Figure 1 shows this menu. The *Main Menu* options *File*, *Edit*, *Window* and *Help* follow the standard Windows-conventions. *Objects*, *View*, *Procs*, *Quick* and *Options* incorporate the special Eviews-features. The bottom line, or *status line*, of the main window provides additional info on the status of various settings of the program. The only relevant part at this point is the *Path:* information. This tells you in which folder Eviews looks for input files first.

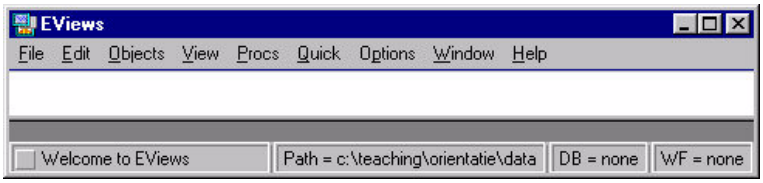


Figure 1: Eviews Main Window

Eviews Help

The Eviews Help-system is comprehensive, it encompasses nearly the entire user's guide. Figure 2 shows the main help topics for Eviews novices.

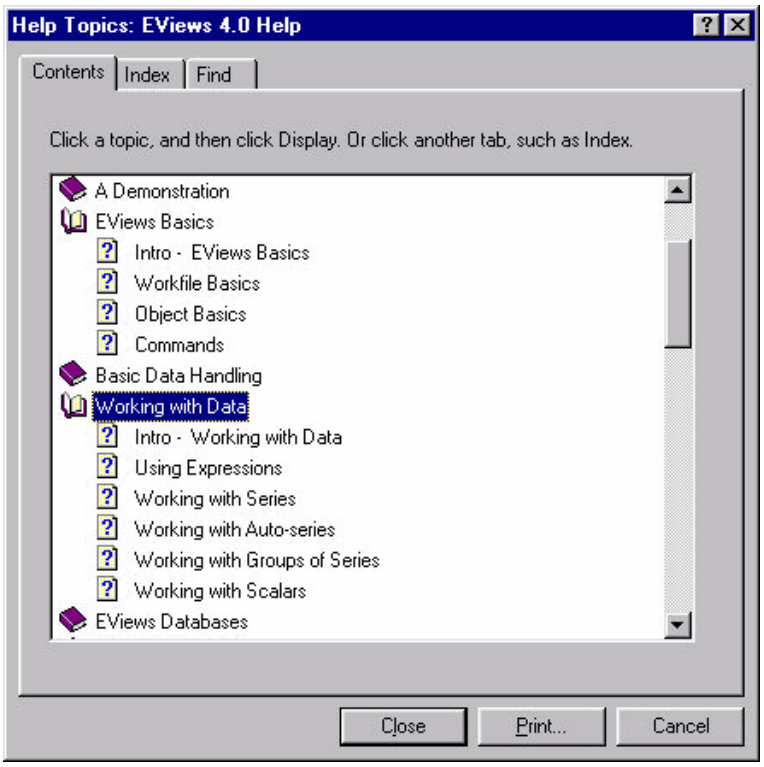


Figure 2: Eviews 4 Help: Table of Contents

The Chapters of the Eviews Windows Help books can be long. It is not possible to do a keyword search **within** a chapter in the Windows Help system. However the Help system also contains `.pdf` files which can be browsed by Chapter and which can be searched using Acrobat Reader, using Ctrl-F or the "binocular" icon within Acrobat Reader.

Use the Help-function later to explore other options of EViews that are not discussed in this document.

Standard Windows functionality

The "Introduction to Eviews" of the Eviews-Help also explains Windows Basics for people who are not familiar with the Windows-system.

Eviews works as a standard Windows-program, like Windows-Explorer. It has the advantage that all menus are text based, so you don't have to learn the meaning of new icons. Pointing and clicking with the mouse is sufficient to browse through all the options and to perform many tasks.

In standard circumstances *left clicking* on an item selects an Eviews object, *right clicking* a selected object opens a menu. *Double clicking* an object opens the specific Econometric View of an object. Many of the standard Windows editing-keys *Ctrl-C* (Copy), *Ctrl-X* (Cut), *Ctrl-V* (Paste), *ctrl-Z* (Undo last edit action) work as expected.

A general **Undo** button to correct your own faults is **not available** and the program is not entirely robust on the network. Therefore: **save your results regularly**, as it is not impossible that the program crashes unexpectedly and all what has been done is lost!

2.3 An Eviews Basics Demonstration

By repeating the actions of this Demonstration you will get to know most of the basic concepts of Eviews: *Workfiles*, *Objects*, *Series*, *Sample*, *Expressions*, *Series*, *Auto-Series*, *Groups*, *Graphs*, compare the table of Contents in Figure 2. Knowing these basics is necessary to find your own way in Eviews later on. We discuss how to

1. create Workfiles, setting a Sample and Import Data
2. save Workfiles
3. navigate most of the Eviews-windows
4. create simple Eviews Objects like Groups
5. use Expressions in the Command window
6. perform standard data tranformations
7. create, adjust and export Graphs

At this stage of the course we cannot use econometric procedures, but some preliminary runs can be done with the data that are provided with the book. We can perform a straightforward data analysis: graphs can be made, correlations can be computed, data can be seasonally adjusted, etc.

2.3.1 Eviews Workfiles and Data Import

The Chapter titled "Workfile basics" of the Eviews Help-system states: "At the heart of the EViews design is the concept of an object. In brief, objects are collections of related information and operations that are bundled together into an easy-to-use unit. Virtually all of your work in EViews will involve using and manipulating various objects. EViews holds all of its objects in object containers. You can think of object containers as filing cabinets or organizers for the various objects with which you are working. The most important object container in EViews is the workfile and your first step in any project will be to create a new workfile or to load an existing workfile into memory".

Therefore, the *workfile* is the starting point in EViews. We create a new workfile for every new project. Within workfiles one works with *objects*, like *series, equations, groups of variables, graphs, tables*, etc.. All these objects are part of the workfile. So the first thing to do in EViews is to create the *workfile* and to import data. This will create the first objects: a number of *series*. In the first session one has to import data into the workfile. An existing workfile can be opened in any EViews-session later on.

EViews can import data in a variety of formats, like ASCII-text and Excel. To import the data, one has to know how the data has been organized in the file. The data files for this course have the standard spreadsheet organization. The observations for the different variables are arranged in columns, with variables names on top.

2.3.2 Creating a Workfile

Here is how you start working with Eviews on the ASCII dataset in the text file into Macro95.dat, which is available in the folder `DataCarlsonThorne`. This file contains quarterly data on 22 US macroeconomic variables running from 1959.1 to 1995.2.

(Re)Start EViews in Windows. Click on *File* and *New*; Then click *Workfile*. A window appears with questions about the data: the frequency and the sample period. Click on the correct frequency (Quarterly) and fill in the correct *Start date* and *End date*. Click 'OK' and change the name *Untitled* in Macro95, by using *File SaveAs*. Choose a directory where you have the permission to save your results! The workfile gets the Eviews-extension .wf1. The new workfile is now saved as Macro95. Do not forget to tick(mark) *Update Default Directory*. This changes the *Path*-Setting in the status line at the bottom of the Eviews Window. EViews will start the next session in the same directory you have just chosen, which is very convenient.

2.3.3 Importing Data in Eviews 4.1 or lower

Now data can be imported in the workfile. Click on *Procs* and *Import* and *Read Text-Lotus-Excel* (in our situation the data are in a text file) and browse for the file, `Macro95.dat` that has to be imported. Click 'OK', and Eviews asks you to select from a range of input-options, see Figure 3. EViews asks whether the data file is organized in Columns or in Rows (formerly called: by observation or by variable). If the data file contains the names of the variables, only the number of variables in the file has to be filled in. In our case there are 22 variables, the first one being a "date"-variable, so we always know the dates of the corresponding observations in the same row of the data set.

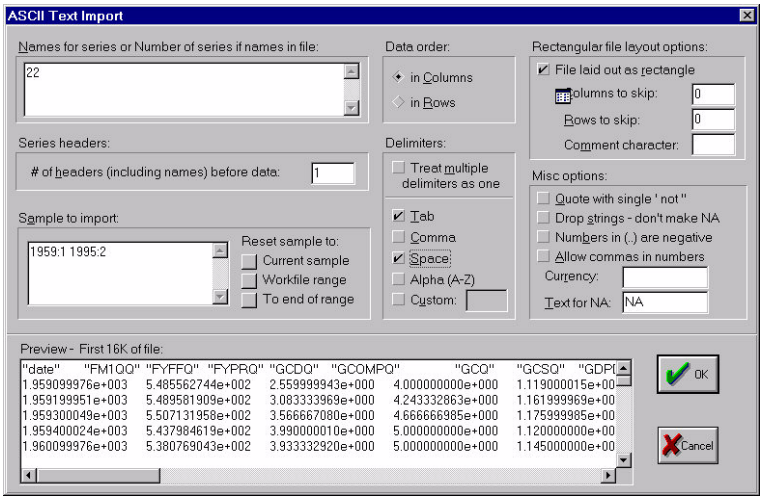


Figure 3: Importing ASCII data from a textfile

There is also a 'preview window' to check that the correct data will be imported and to see that the data really are organized in columns. If the data are **not** neatly organized in a matrix, do **not** mark '*File laid out as rectangle'*.

If your ASCII-data are **not** in the right format, you should edit them in a text-editor. Eviews contains a primitive text editor. Select *File-Open-TextFile* from the main menu and open `Macro95.da0` (a copy of Macro95.dat, since the basic version of Eviews 4 does not allow opening .dat files in this way). to see how it looks in a text editor. Much better freely availble text-editors exist, see e.g. `OxEdit`, `www.oxedit.com`, an editor that is also installed in the computer lab.

2.3.4 Checking Imported Data and Saving the Workfile

If all has been done correctly, the names of the variables appear in the workfile window, otherwise wrong names like *ser01, ser02,* etc. are seen in the workfile. The different variables are called *Series* in Eviews, even if the observations are not ordered according to time, in which case Eviews labels them as undated or irregular series. *Series* are *Eviews Objects* that we use most often. Statistical and econometric methods can now be used to analyze the variables. Extra data can be imported at a later stage.

Double click a series name (with the left mouse button). A new window with its own buttons appears. See the options under *View*, check a spreadsheet View and a graphical view of the Series and see whether the data have been imported correctly.

If your are satisfied with the imported data you should **Save the Current Workfile** using *File-Save* from Eviews Main Window. To reuse your workfile in a next session, start again by clicking on *File*. Then the names of the last used workfiles are visible in a 'history list' and one can select directly a workfile from this list. It is also possible to double click on the name of the workfile in the "Microsoft explorer" or "Total Commander" (`http://www.ghisler.com/`. Then EViews starts with that workfile if the extension (.wf1) has been associated with the EViews program in your file browser. If this is not the case, Right-click on a .wf1 file and look at the *Properties*, then look under the *General* tab on the line with `Opens with` and browse to the executable Eviews5.exe (if your Eviews version is 5).

2.3.5 Creating Workfile from a 'Foreign' Excel file in Eviews 5

Since Eviews version 5 it is also possible to Open excel data, while simultaneously creating a Workfile. Use *File-Open-Foreign Data As workfile* from Eview Main Window. Figure 4, 5, 6 show what happens if you open `macro95Eviews51.xls` in that way. case. The workfile and the group with variables are automatically created. The dates are stored according to Eviews and associated labels are created in the label series `OBS`, if the .xls file was created with Eviews 5 using the Eviews date format.

2.3.6 Eviews menus and Creation of Simple Objects: Groups and Equations

Once you have successfully loaded data into a workfile it is time to browse through the special options of the main Eviews menu of Figure 1 again.

The *Object*-drop-down menu allows you to create all types of new objects and to rename and **delete** existing objects. You can create a new *Series* if you want to type the data in

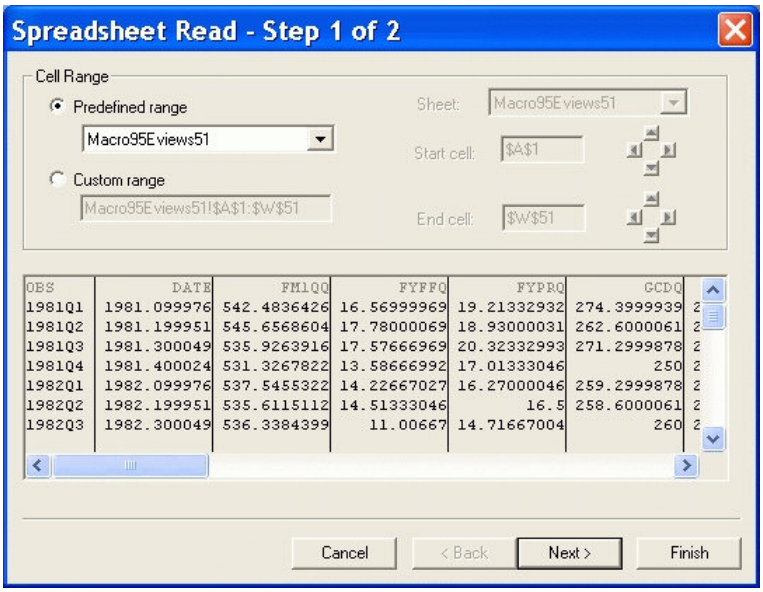


Figure 4: Open .xls Data as a workfile, step 1

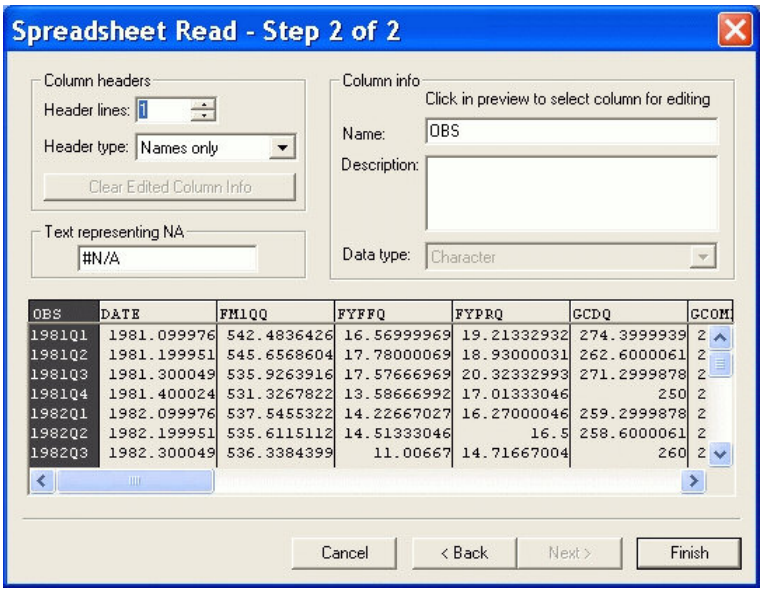


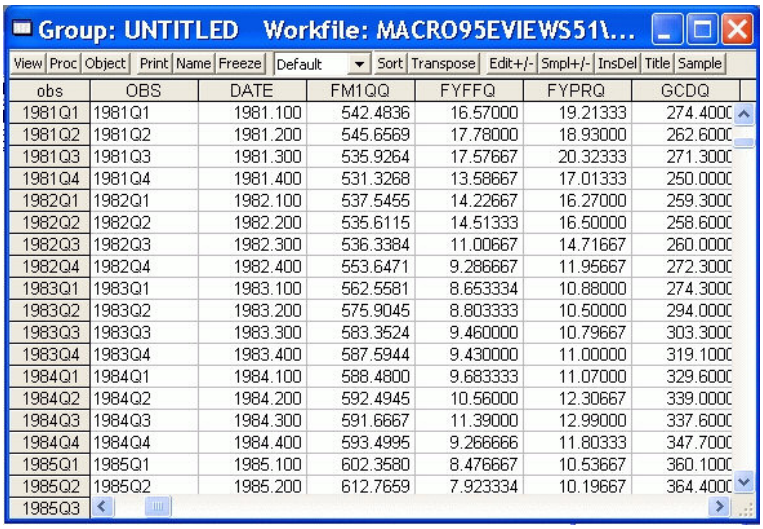
Figure 5: Open .xls Data as a workfile, step 2

yourself.

The *Quick*-menu provides quick shortcuts for experienced Eviews users. A useful application of the *Quick*-menu is provided in §2.3.8

The drop down menus under *View*, *Procs* in the main Eviews menu are context sensitive: The range of options depends on the object(s) selected at the moment of the analysis. Similar *View* and *Procs* menus are also available in the windows of the objects themselves.

Check this out for the a Series-object. Double click on a variable name in the Workfile-window: an Eviews-*Series*-window pops up. Under *View* you'll find the *graphs* and *descriptive statistics* that we need in a first stage data analysis, under *Procs* you'll find more advanced options like *Exponential Smoothing*. Note that the same options are now available



obs	OBS	DATE	FM1QQ	FYFFQ	FYPRQ	GCDQ
1981Q1	1981Q1	1981.100	542.4836	16.57000	19.21333	274.400
1981Q2	1981Q2	1981.200	545.6569	17.78000	18.93000	262.600
1981Q3	1981Q3	1981.300	535.9264	17.57667	20.32333	271.300
1981Q4	1981Q4	1981.400	531.3268	13.58667	17.01333	250.000
1982Q1	1982Q1	1982.100	537.5455	14.22667	16.27000	259.300
1982Q2	1982Q2	1982.200	535.6115	14.51333	16.50000	258.600
1982Q3	1982Q3	1982.300	536.3384	11.00667	14.71667	260.000
1982Q4	1982Q4	1982.400	553.6471	9.286667	11.95667	272.300
1983Q1	1983Q1	1983.100	562.5581	8.653334	10.88000	274.300
1983Q2	1983Q2	1983.200	575.9045	8.803333	10.50000	294.000
1983Q3	1983Q3	1983.300	583.3524	9.460000	10.79667	303.300
1983Q4	1983Q4	1983.400	587.5944	9.430000	11.00000	319.100
1984Q1	1984Q1	1984.100	588.4800	9.683333	11.07000	329.600
1984Q2	1984Q2	1984.200	592.4945	10.56000	12.30667	339.000
1984Q3	1984Q3	1984.300	591.6667	11.39000	12.99000	337.600
1984Q4	1984Q4	1984.400	593.4995	9.266666	11.80333	347.700
1985Q1	1985Q1	1985.100	602.3580	8.476667	10.53667	360.100
1985Q2	1985Q2	1985.200	612.7659	7.923334	10.19667	364.400
1985Q3						

Figure 6: Open .xls Data as a workfile, step 3

under *View* and *Procs* in the main Eviews menu.

Within a workfile it is possible to create other *Objects* like *Groups* of variables. Eviews-Groups are extremely useful objects. The Eview-Help says: "A group is simply a list of series identifiers. It is **not** a copy of the data in the series. Thus, if you change the data for one of the series in the group, you will see the changes reflected in the group".

A group is created very easily. With the left-handed mouse button you select one series first. To create a group more series can be added to the selection by keeping 'Ctrl' pushed down and clicking with the left-hand mouse button on the relevant variable names, after which it becomes a group by selecting *Open selected* (under *View*), *One window* and *Open group*. See also Figure 11 below, which shows an example of a group selection in the (background) Workfile-window.

If you want to specify an *equation*-object you should click on the name on the left-hand-side variable of the equation first. When you specify a regression equation later on it has to be the first variable in the list.

It is also possible to click on the selected variable names with the right-hand mouse button. Under *View* and *Procs* many possibilities arise to analyse the group (*group statistics*, various *graph* options, etc.); also regression equations are simply formed. After a procedure has been applied (e.g. least squares) one can proceed with the analysis with new possibilities given under *View* again (e.g. *residual tests*, *coefficient tests*).

The best way to learn the various possibilities of a procedure is to click on the various buttons and to see what the possibilities are for the object in question. The structure is logical and the help function is often adequate, provided you know the basic terms an techniques, of course.

Remember to **save the workfile** at the end of the session, so that everything what has been done (transformed variables, equations, maybe groups etc.) is available in the next session.

Each result (object) can be sent to the (laser) printer by clicking on *Print* in the toolbar

of that particular window, but it is better to export them to another program like Word and make a simple report, before sending the results to the printer.

2.3.7 Command Window, Data Transformations and expressions

Transformations can most easily be specified in the white top-window, the so-called Command window. Type

```
series lgcq = log(gcq)
```

which generates a new series `lcgq` (after you press the *Enter*-key) and computes the logs of the consumption series `gcq` or use

```
series dgcq = gcq - gcq(-1)
```

which takes the first differences: it subtracts consumption in quarter $t-1$ from consumption in quarter t. Typing

```
show dgcq
```

in the Command-window brings up the Series-Window of `dgcq`. This is a quick way to start checking whether your transformation was successful.

You can also transform series by clicking on the button *Genr* in the workfile-window (then e.g. only `lgcq = log(gcq)` has to be specified). Many other Eviews *Expressions*: transformations, functions and operators are available, see the *Function Reference* of the main *Help(-Reference)* menu.

The *Command Window* keeps record of the commands by maintaining a 'history list'. This can be an advantage if similar operations have to done repeatedly. Old command lines can be selected, adjusted and "rerun": simply select the line in the command window and press the *Enter*-key. Most procedures can be applied in the command window. The *Command reference* of the main *Help*-menu provides all the commands.

Once you know some commands this can save you time. For example: a quick way to re-import the data is to type

```
read macro95.dat 22
```

in the command window, provided the file `macro95.dat` is in the current Eviews-Path (see status line at bottom Main Window).

After generating many Eviews-subwindows it is sometime hard to find the command window on your screen. You can always retrace the command window by clicking *Window* on the main menu of the main Eviews window. The command-window is always no. 1 in that list.

2.3.8 AutoSeries, Changing Data points

It is not always necessary to transform variables and save the results in a separate series. Transformed data enlarge the contents of the workfile. It is also possible to use the AutoSeries (Automatically generated Series) feature of Eviews. For example, the specification of

```
d(gcq)
```

in the specification of a group or in the specification of an equation refers to the first dif-

ferences (i.e. the changes over 1 period) of `gcq`, without generating observations in a new variable permanently.

We shall see how this works by looking at the effect of a change in one of the observations of the series `gcq` on the "Auto-observations" in the AutoSeries `d(gcq)`:

Generate a new group consisting of `gcq` and `d(gcq)`: Type

```
group transgcq gcq d(gcq)
show transgcq
```

in the command window. A new group, titled `transgcq` has been formed. Open the Spreadsheet View of `transgcq`: Click on *View-Spreadsheet* in the Group window of transgcq.

Edit the values of one of the observations of `gcq`: Click on *Edit+* in the Group window of transgcq, click on the cell of `gcq` that you want to change. The corresponding value appears near the top of the window. Change the value and push *Enter* on your keyboard. The corresponding values of `d(gcq)` change as well! Note that you cannot edit the values of `d(gcq)`. Now you know why.

Note that you also could have used *Quick*-button of the main menu to bring up the previous spreadsheet view. Use *Quick-Show* and type `gcq d(gcq)` in the resulting *Show*-window and press *OK*. You can then change the name of the group by pushing the *Name* button in the group-window and entering the name `transgcq`

AutoSeries can also involve more complicated expressions like `d(log(gcq))`, which computes the first differences of the logs of `gcq`.

2.3.9 Examples of EViews output: Graphs and export Graphs to Word

First an example is given of *Multiple Graphs*, *Line* in an EViews Group window. The series `gcq` and `gidpq` have been opened as a group first. These graphs are then created in the *group window* under *View*. See Figure 7. These graphs should correspond to Figures 17.1

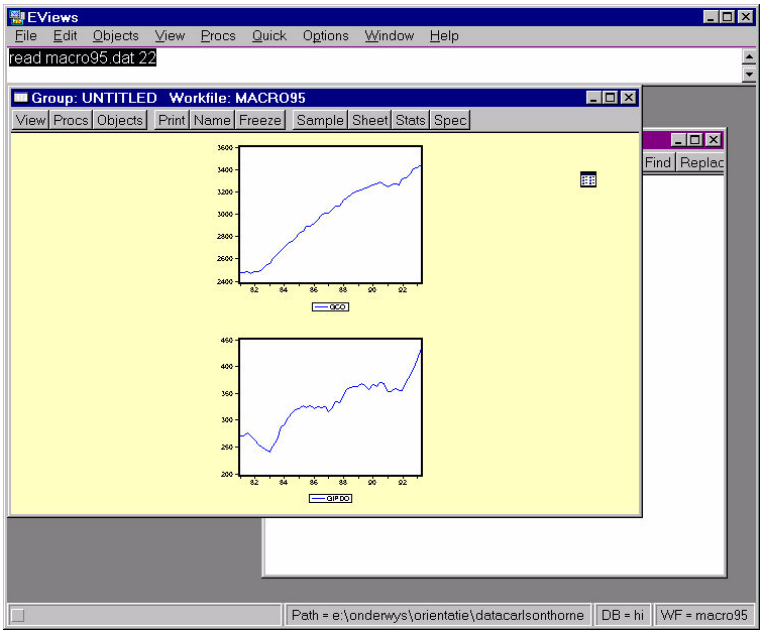


Figure 7: Multiple Line Graphs from Group Window

and 17.2 on pages 826 and 827 in the book of Carlson and Thorne. Check the **sample** if they do not correspond.

In order to use the resulting picture in another program you should save it as a Windows-metafile with the extension *.wmf*: Use the *Copy* command under *Edit* in the main menu of the main Eviews-window, and choose *Save Metafile to disk* or *Copy to disk file*, choose the .wmf format, then select a directory and choose a name, for example `eviewsgraph1.wmf`. The option *Copy to clipboard* is not advised.

The picture can subsequently be imported in a Word document using *Insert-Picture-From File*. See Figure 8

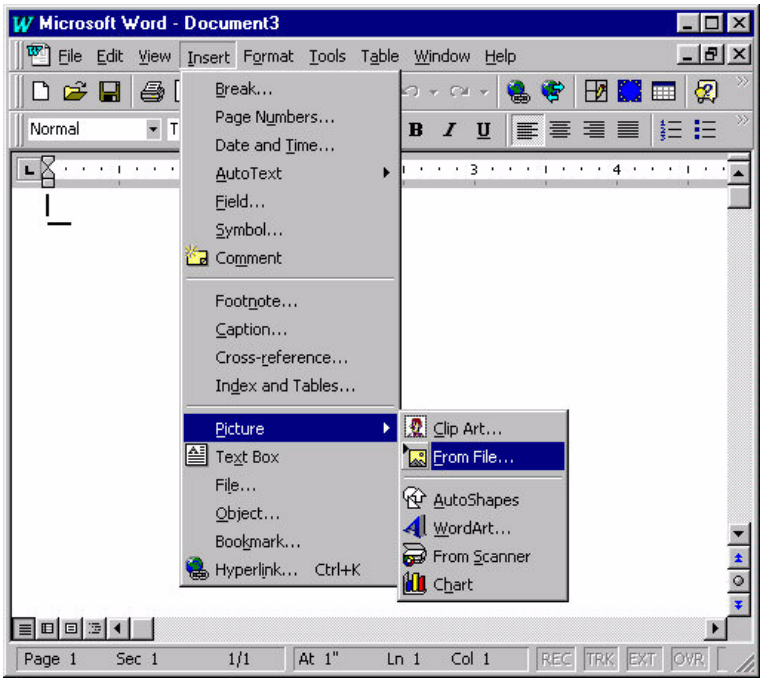


Figure 8: Inserting Eviews picture in .wmf format into Word

You can also "Edit" the graph with Eviews. Labels can be dragged to another place to a new place in the graph: Click on the label, hold the mouse button pressed and move the label. The label text can been changed as well: Double click on the label or use the right-hand mouse button.

Clicking on the picture with the right-hand mouse button (or double clicking with the left-hand button: gives more options) produces an 'Options window' to change the general outlook for different types of graphs, like a *regression line* in a scatter diagram or *a zero line* in a line diagram. See Figure 9 for Eviews 3 and Figure 10 4 for Eviews 4. . .

2.3.10 Scatter diagram

To create a scatter diagram select in the 'Group window': *Graph*, *Scatter* and the scatter type. Optional is the 'regression line'. In Figure 11 there is no regression line. ;

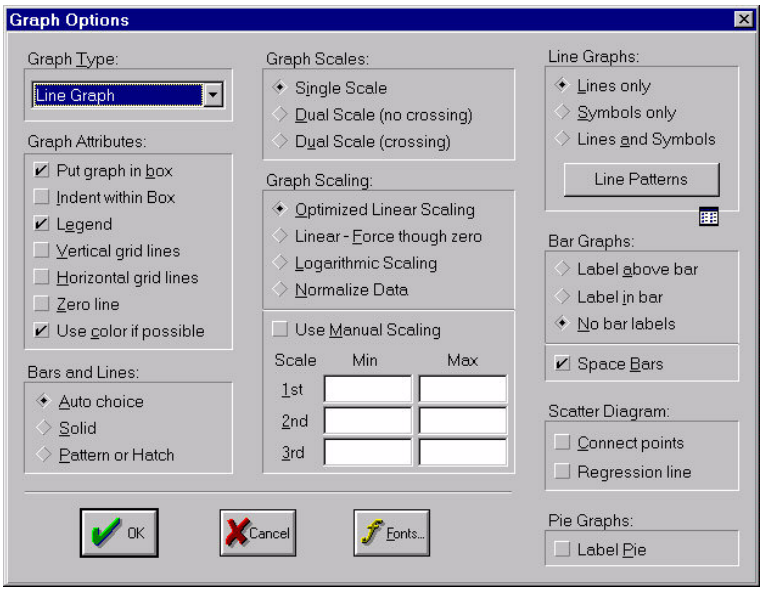


Figure 9: Graph Options Eviews 3

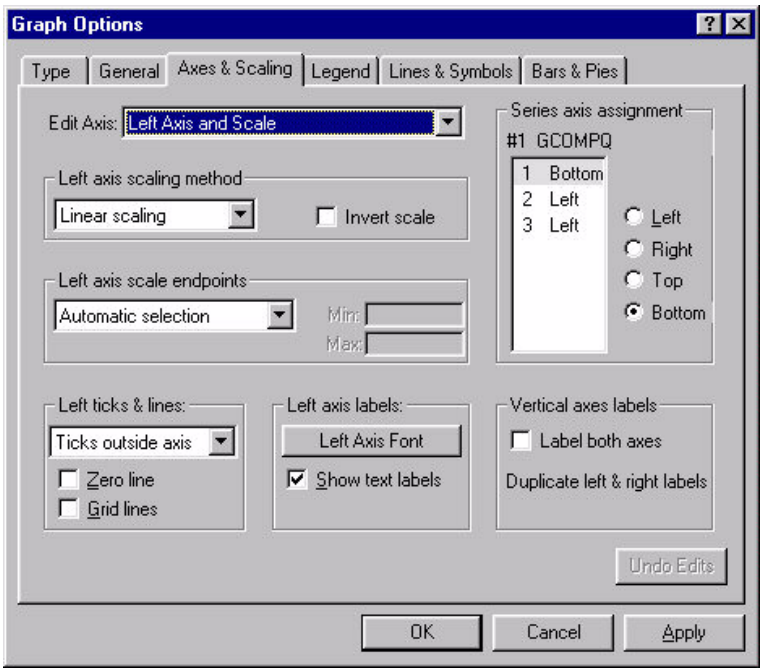


Figure 10: Graph Options Eviews 4

2.3.11 Eviews Tables, editing and Exporting Tables to Word

At the end of this demonstration we show how to generate, edit, save and export numerical output of Eviews.

(Re)Show the group `transgcq` that we created in the section on Autoseries. Look for `transgcq` in the Workfile-window, or create it as a new group using *Quick-Show* and entering `gcq d(gcq)`.

We create descriptive statistics from the pull-down menu under *View* in the *Group*-window: *View-Descriptive Stats-Common Sample*. The standard descriptive statistics of

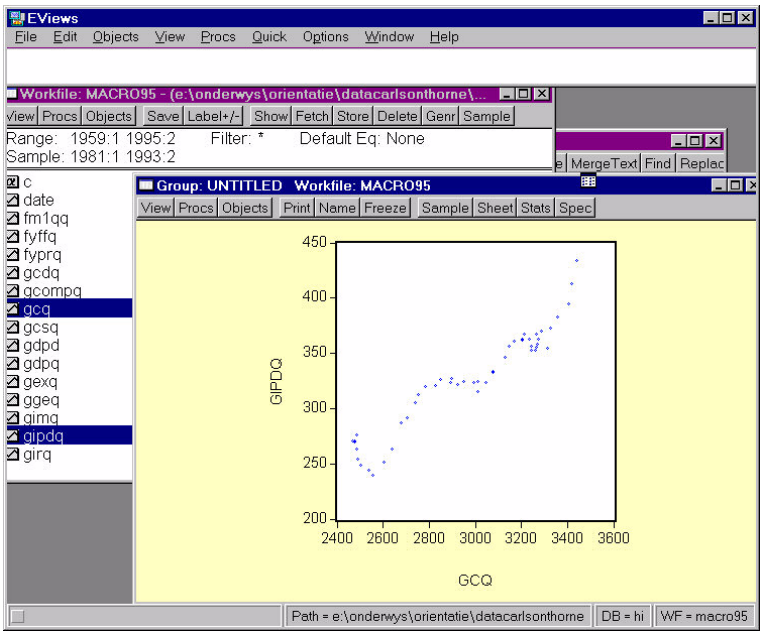
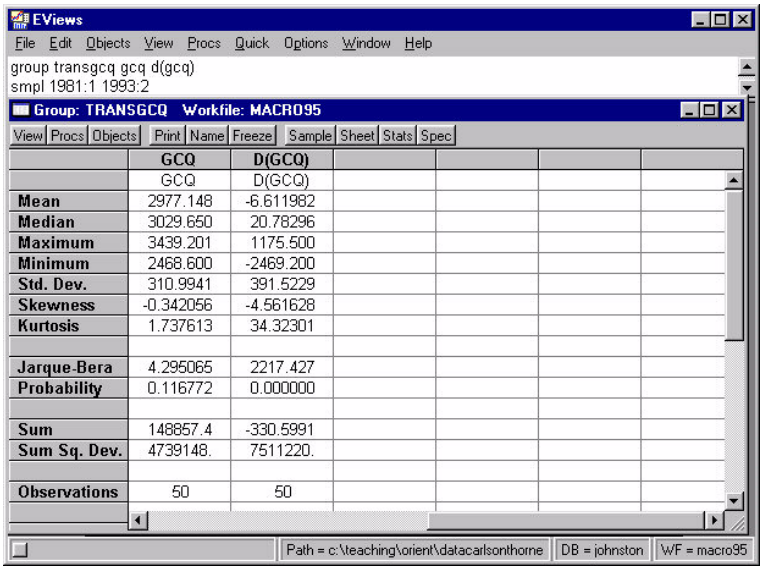


Figure 11: A scatter plot from the Groups Window

Eviews appear. See Figure 12.



	GCQ	D(GCQ)
	GCQ	D(GCQ)
Mean	2977.148	-6.611982
Median	3029.650	20.78296
Maximum	3439.201	1175.500
Minimum	2468.600	-2469.200
Std. Dev.	310.9941	391.5229
Skewness	-0.342056	-4.561628
Kurtosis	1.737613	34.32301
Jarque-Bera	4.295065	2217.427
Probability	0.116772	0.000000
Sum	148857.4	-330.5991
Sum Sq. Dev.	4739148.	7511220.
Observations	50	50

Figure 12: Descriptive Statistics in a Group Window

Suppose now we want to edit and export this output. Then we should push the *Freeze* button of the Group-window, or we could use *Object-Freeze Output* from Eviews' main menu. A *Table*-window pops up in a spreadsheet format. You can edit the output of the table after pushing the *Edit+/-* button in the Table-Window. You can also change the appearance by changing the font and cell-width in the table. Once you are satisified with the results you may want to export them to Word. First select the part of the table that you want to export with your mouse. Then export this part of the table using *Edit-Copy* from the main menu of Eviews, see Figure 13. Eviews will ask whether you want to export

the numbers formatted or unformatted. Choose formatted if you do not want to do further computations with the numbers.

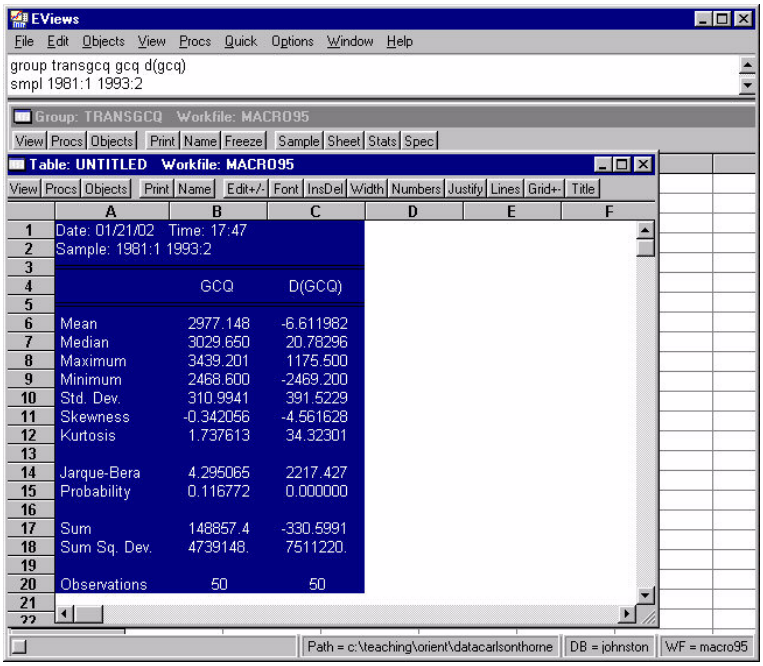


Figure 13: Exporting contents of an Eviews Table

Finally, import the Eviews-output in Word using *Edit-Paste*. See Figure 14. In Windows-language the last operations are described as: "Copy the contents of the Eviews-table to the Windows-clipboard. Paste the contents from the Windows-clipboard into your Word document." The Paste-icon on Word's main toolbar, shows a picture of the clipboard and a sheet of paper being removed, see Figure 14.

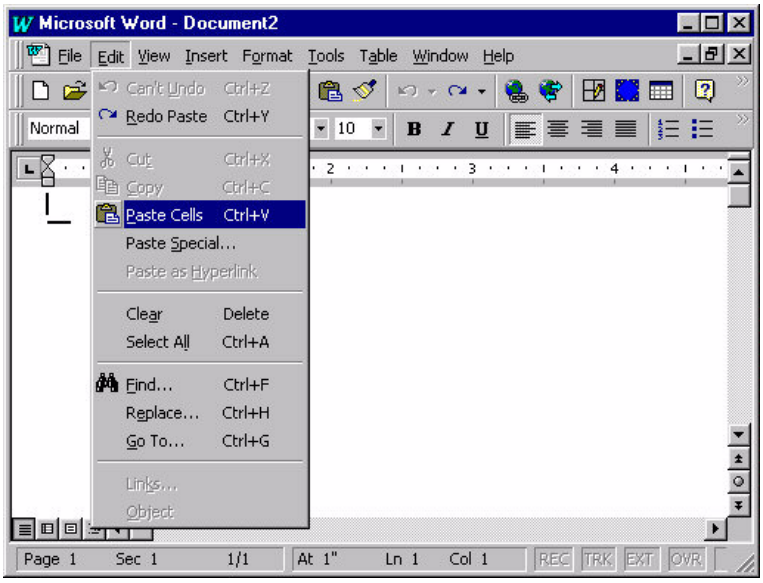


Figure 14: Importing contents of an Eviews Table in Word

2.4 Advanced use of Eviews Help Examples: Maximum Likelihood

The help files for advanced objects often describe two ways to estimate models. The first (user manual) examples show how to create an object **using menus** and then tell what to enter in the Object Window. Many other (reference manual) examples just tell you the **Eviews-commands**, i.e. the commands that should be entered **in the command window**. Here we describe how to use the Eviews Help examples for the *LogL* (loglikelihood) object and the corresponding `ml` (maximum likelihood) function, that is the most important member of this object. For user manual help, see *Help-Contents -The Log likelihood (LogL) Object*. For reference manual help, see *Help-Help Reference-Object Reference-*`Logl`.

In order to use the examples of the manuals we have to create a workfile and example series. We do this preparatory work **in the command window**:

```
create a 1900 2000
series x = 3*@rnorm
series z = 2*@rnorm^2+0.2
series y = x + z + @rnorm
```

Now we can start to apply the examples of the basic Eviews user Help system. The first example creates the loglikelihood using the main menu. This is an example of the type that you find near the beginning of the Help Chapters by user tasks and estimation methods in the *Contents* Index of the *Help-Eviews Help topics* System.
To create a LogL Object use the menus *Object-New Object-LogL*.
Then you should enter the following lines **into your log likelihood object**, to be more specific: in the Likelihood Specification View of the LogL object.

```
@logl logl1
res = y - c(1) - c(2)*x - c(3)*z
var = c(4) * z^c(5)
logl1 = log(@dnorm(res/@sqrt(var))) - log(var)/2
param c(1) 1 c(2) 1 c(3) 1 c(4) 1 c(5) 1
```

Then simply click the *Estimate* button in the likelihood window toolbar to open the *Estimation Options* dialog. By default, EViews uses the values stored in the coefficient vector, (`c()`), prior to estimation. The default values are zero, which results in zero values for the variance series `var`, which makes that the series of loglikelihood values `logl1` cannot be computed and initial estimates cannot be obtained. If a `param` statement is included in the specification, the values specified in the statement will be used instead. This is a necessary addition to the Eviews example.

The second way is to create the loglikelihood object (i.c. with name `hsmodel`), add its

members (i.e. the series `logl1, res` and `var`) and do the estimation **only by commands in the command window**. These commands can also be used in Eviews programs.

```
logl hsmodel
hsmodel.append logl1
hsmodel.append res = y - c(1) - c(2)*x - c(3)*z
hsmodel.append var = c(4) * z^c(5)
hsmodel.append logl1 = log(@dnorm(res/@sqrt(var))) - log(var)/2
hsmodel.append param c(1) 1 c(2) 1 c(3) 1 c(4) 1 c(5) 1
hsmodel.ml
```

This is an example of the type that you find in the Reference Manual: *Help-Help Reference* and that you find near the end of the Help Chapters by *Estimation Method* in the *Contents* Index of the *Help-Eviews Help topics* System. Remember that these (object oriented) commands (with dots) should be typed in the **Command Window**! *Window-Command*.

3 Conclusion

This introduction is not complete. In the coming weeks we shall provide exercises to help you get the necessary skills and to help you understand the econometric concepts discussed in the relevant chapters of the textbook.

References

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