

# EViews: A Graphical Perspective

Econometrics and Statistics for Financial Markets 8061, Prof. C.A. Favero

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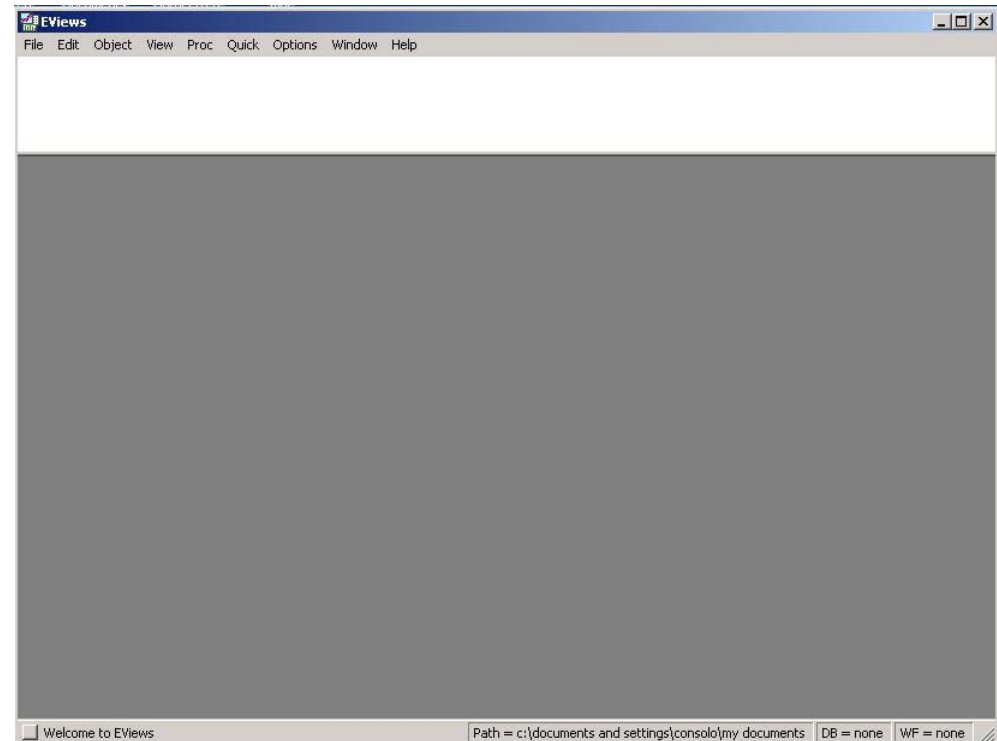
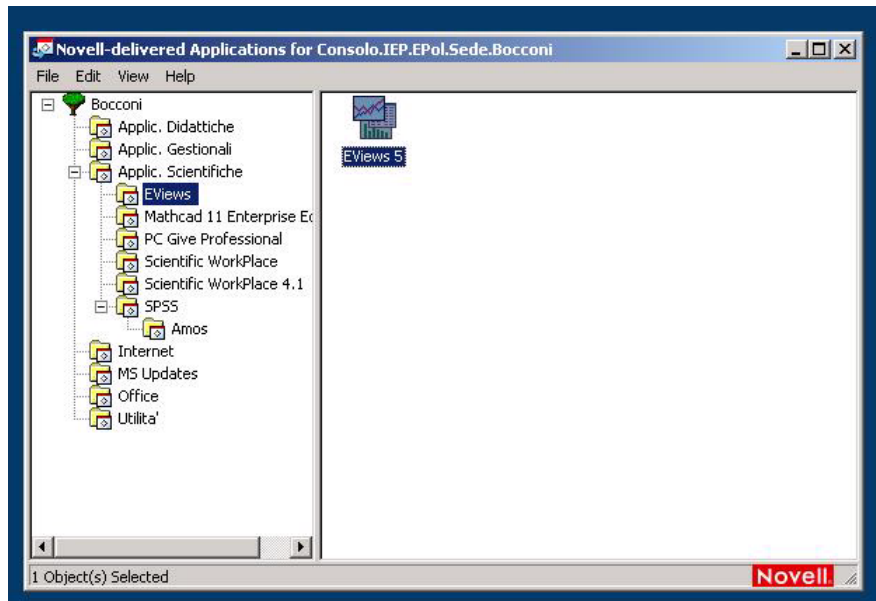
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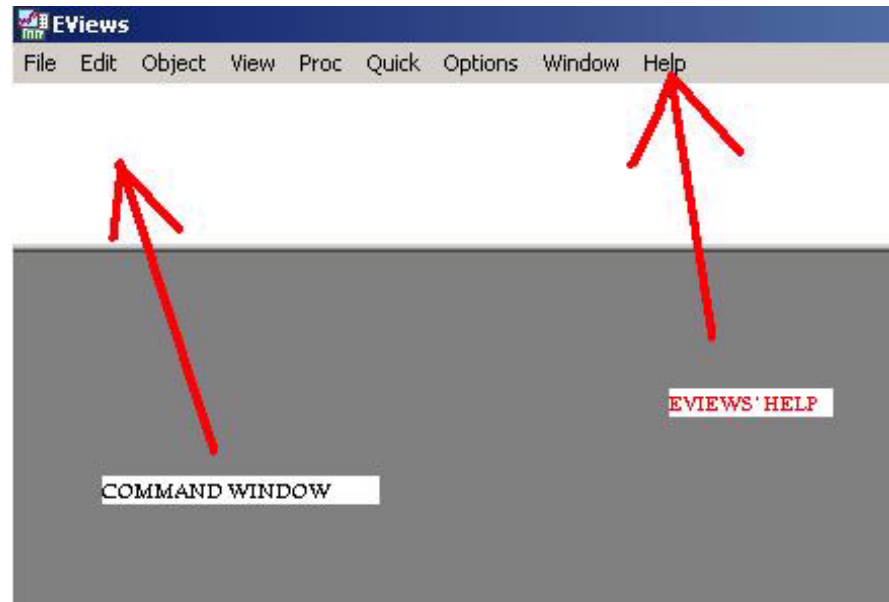
# 1 Introduction

How to Start EViews from the PC Lab: Go to the **Novell-Delivered Application** and double click on **EViews**



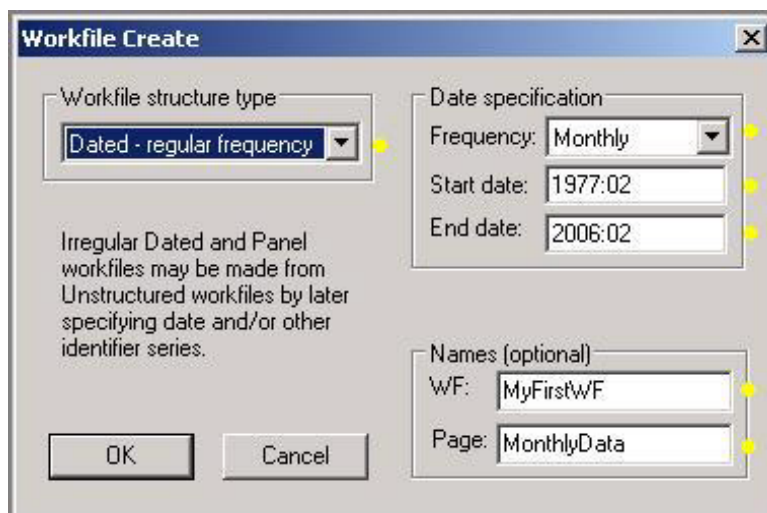
## 1.1 Command Window

During this presentation, I will sometimes refer to the **Command Window** where you can run EViews commands. However it would be better to use program codes (I will explain later on what they are)

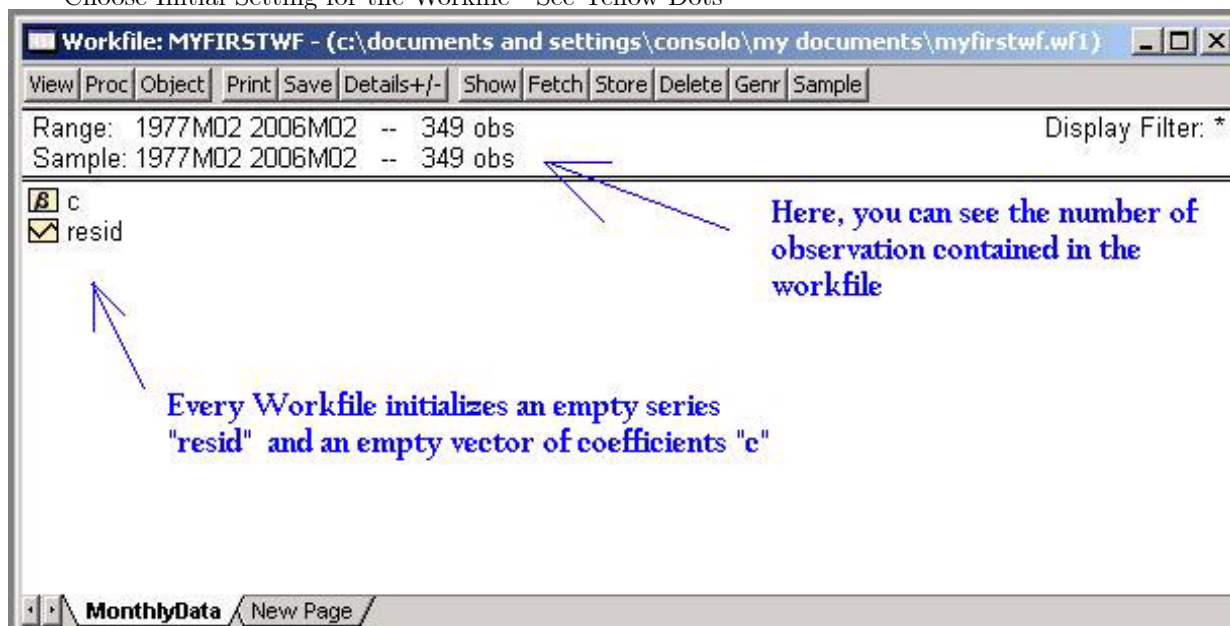


## 1.2 EViews Workfile Interface

The main work space in EViews is the so called **Workfile**. To open a workfile, go to *File->New->Workfile*. Now, we need to specify few things such as, the **frequency** of the data, the **start** and **end date** and to give a **name** to the workfile



Choose Initial Setting for the Workfile - See Yellow Dots



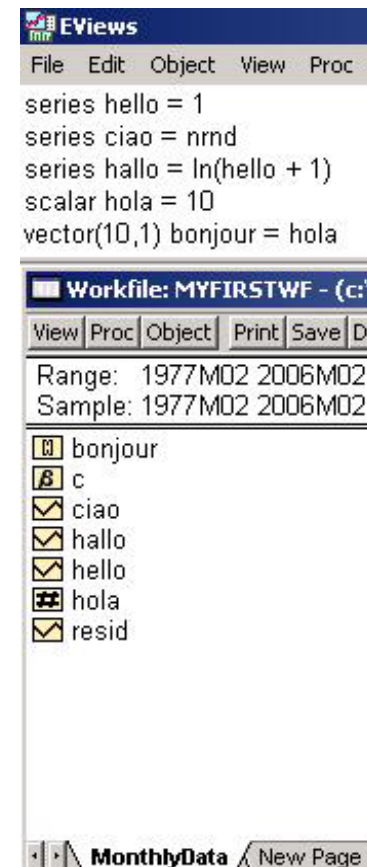
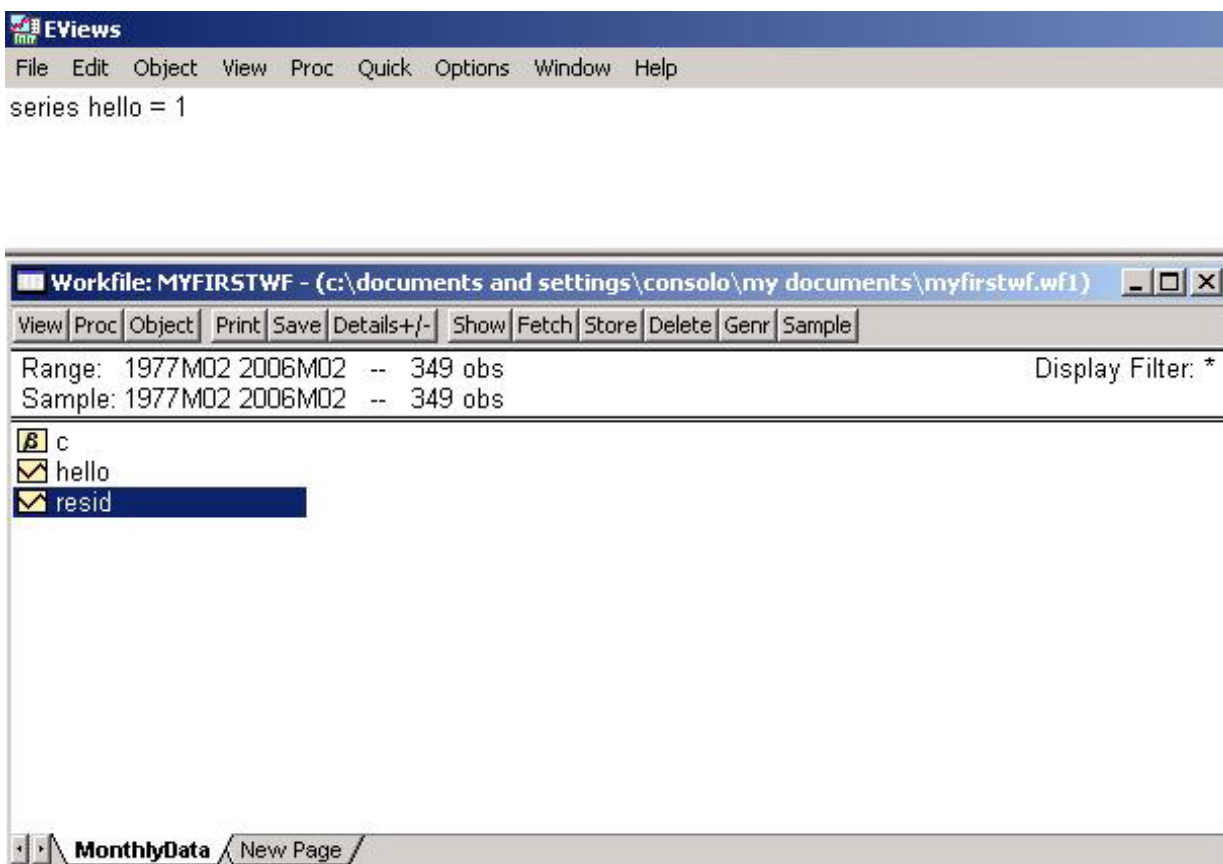
Here, you can see the number of observation contained in the workfile

Every Workfile initializes an empty series "resid" and an empty vector of coefficients "c"

### 1.3 EViews Workfile: My First Time Series

Let us create a series of ones which spans over the entire sample, from 1977 Feb to 2006 Feb. In the **Command Window**, type:

`series hello = 1` and press enter



You can also generate other series like

- `series ciao = nrnd` (A Series of Draws from a Gaussian Distribution -  $N(0,1)$ )
- `series hallo = log(hello + 1)` (Take the Natural Logarithm)

Or, you can create a scalar

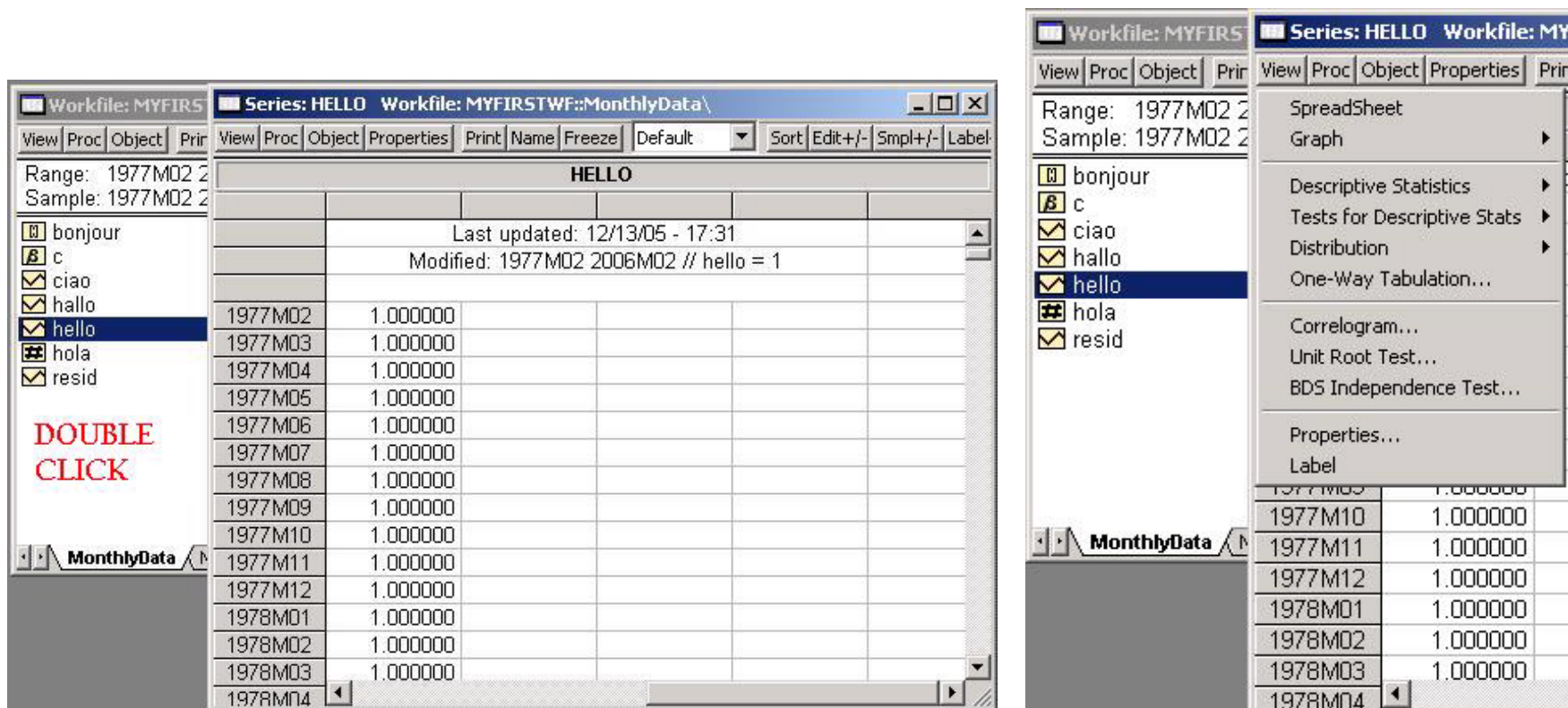
- `scalar hola = 10`

Or, a vector

- `vector(10,1) bonjour = hola` (It defines a column vector and it initializes it to 10)

## 1.4 EViews Workfile: A deep look #1

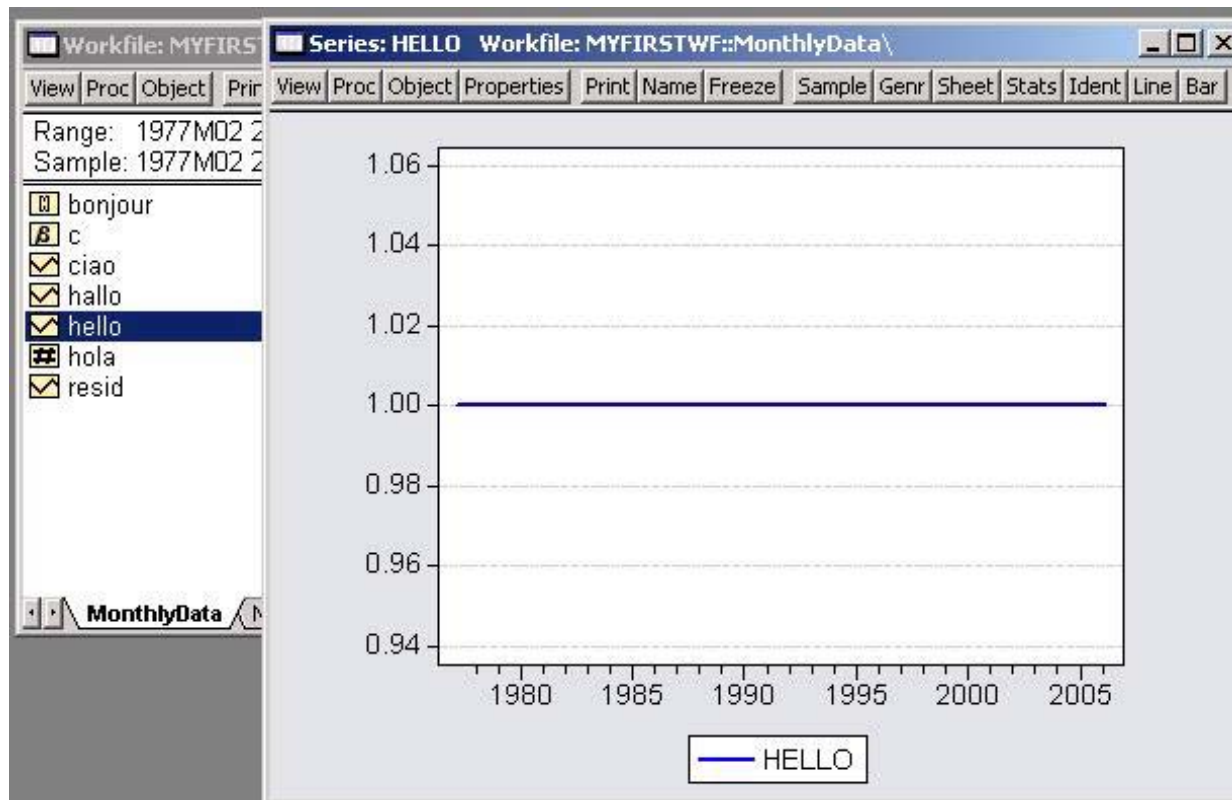
Once we have created a time series, we would like to plot it or to get some descriptive statistics like the mean, the variance etc. An easy way to easily perform all these tasks in EViews is to go through the **Workfile** Menu or by a double click on the series we are interested in



- Double click on the series **hello** and it opens itself showing the worksheet
- You can edit the worksheet by clicking on *Edit +/-* and change the value of the time series

## 1.5 EViews Workfile: A deep look #2

- By clicking on *View* we can start doing some analysis. Click on *View->Graph* to see the time evolution of the series **hello**
- Since **hello** is constant over time, let us take the series **ciao** and calculate the descriptive statistics: *View->Descriptive Statistics->Stats Table*

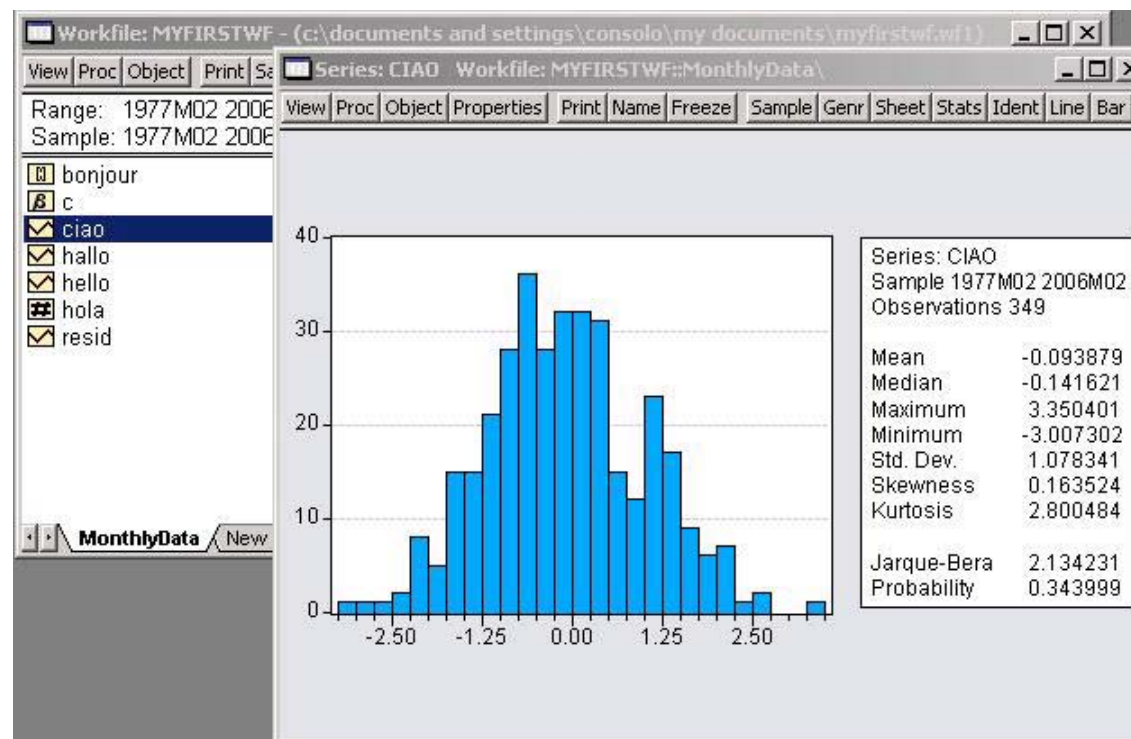


The screenshot shows the EViews 'Series: CIAO' window with a descriptive statistics table. The table lists various statistical measures for the series 'CIAO' over the range 1977M02 to 2006M02. The series 'ciao' is selected in the list on the left.

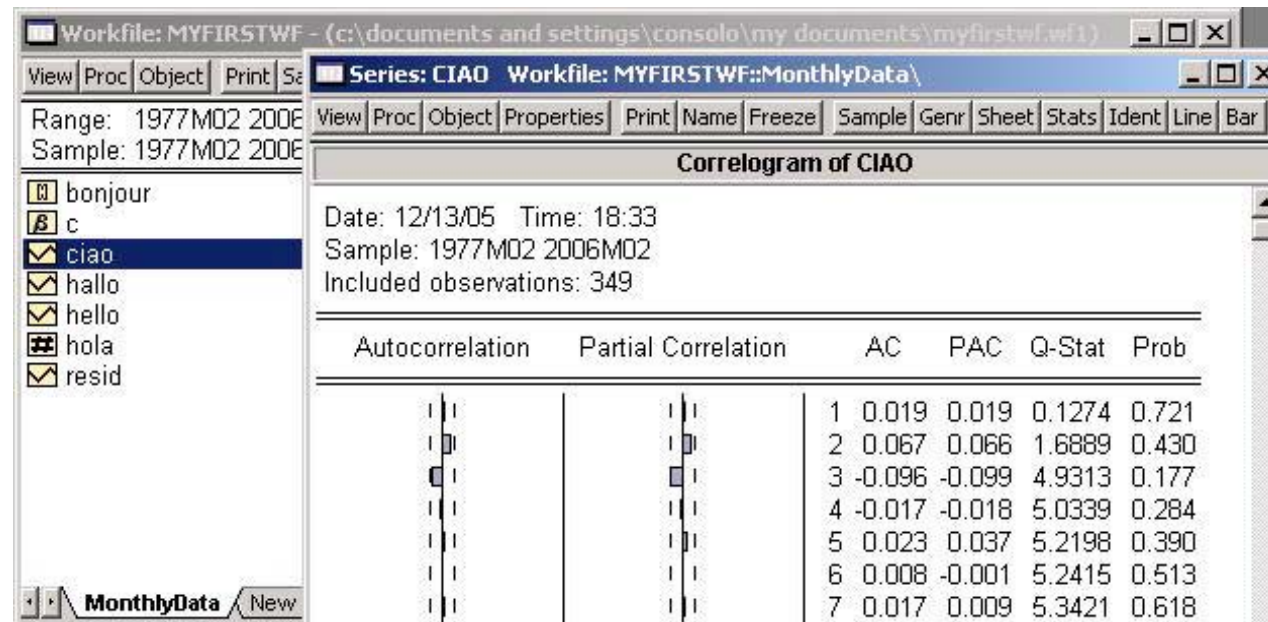
| Series: CIAO |           |
|--------------|-----------|
| Mean         | -0.093879 |
| Median       | -0.141621 |
| Maximum      | 3.350401  |
| Minimum      | -3.007302 |
| Std. Dev.    | 1.078341  |
| Skewness     | 0.163524  |
| Kurtosis     | 2.800484  |
| Jarque-Bera  | 2.134231  |
| Probability  | 0.343999  |
| Sum          | -32.76393 |
| Sum Sq. Dev. | 404.6610  |
| Observations | 349       |

## 1.6 EViews Workfile: A deep look #3

- If you want to see an empirical distribution of the time series `ciao`, together with some descriptive statistics go to *View*->*Descriptive Statistics*->*Histogram and Stats*

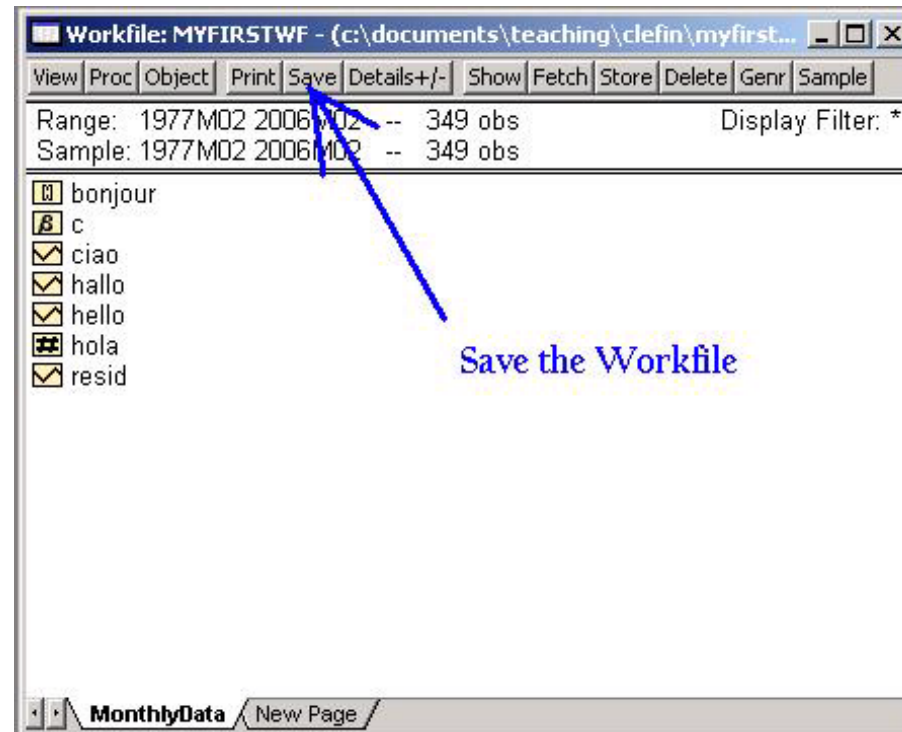


- If we instead want to calculate the autocorrelation and partial correlation function, we can go to *View->Correlogram*
- We have to choose up to which order we have to calculate the autocorrelation and whether to use the time series in levels or in difference (for the picture below, we have used *ciao* and chosen *36 Lags* and *Level Specification* )



## 1.7 EViews Workfile: Good Bye

If we want to **save** the EViews **Workfile**, we just need to click on *File->Save As*. Doing so, we can use the same file to perform other calculations or to create other variables of interest.



## 2 Importing Data

Here we are going to present a simple procedure to upload data from an Excel file. An alternative way based on a batch mechanism will be showed in the *Programming* section.

## 2.1 Importing Data: Excel

In general, we will be dealing with Excel format data set (i.e. Excel Sheets). We thus want to understand how to upload an Excel Sheet into Eviews.

Let us start from a view of the **Excel Sheet**

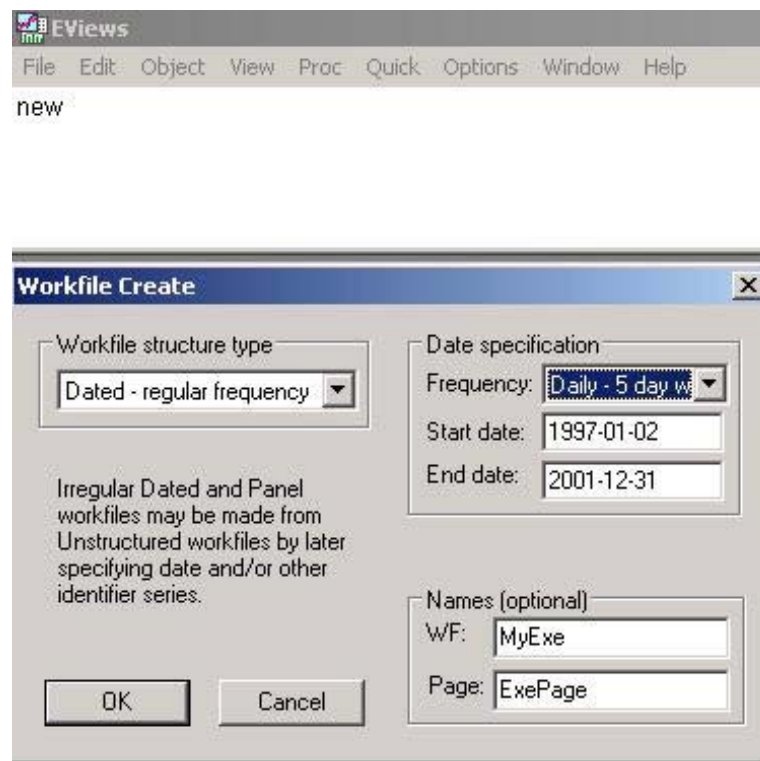
|    | A           | B            | C | D                   | E                |
|----|-------------|--------------|---|---------------------|------------------|
| 1  | <b>DATA</b> |              |   |                     |                  |
| 2  | <b>Date</b> | <b>Close</b> |   | <i>Start Date :</i> | <i>02-gen-97</i> |
| 3  | 02-gen-97   | 737.01       |   | <i>End Date :</i>   | <i>31-dic-01</i> |
| 4  | 03-gen-97   | 748.03       |   |                     |                  |
| 5  | 06-gen-97   | 747.65       |   |                     |                  |
| 6  | 07-gen-97   | 753.23       |   |                     |                  |
| 7  | 08-gen-97   | 748.41       |   |                     |                  |
| 8  | 09-gen-97   | 754.85       |   |                     |                  |
| 9  | 10-gen-97   | 759.50       |   |                     |                  |
| 10 | 13-gen-97   | 759.51       |   |                     |                  |
| 11 | 14-gen-97   | 768.86       |   |                     |                  |
| 12 | 15-gen-97   | 767.20       |   |                     |                  |

which shows that we have a daily time series (from *monday* to *friday*; 5 days per week only).

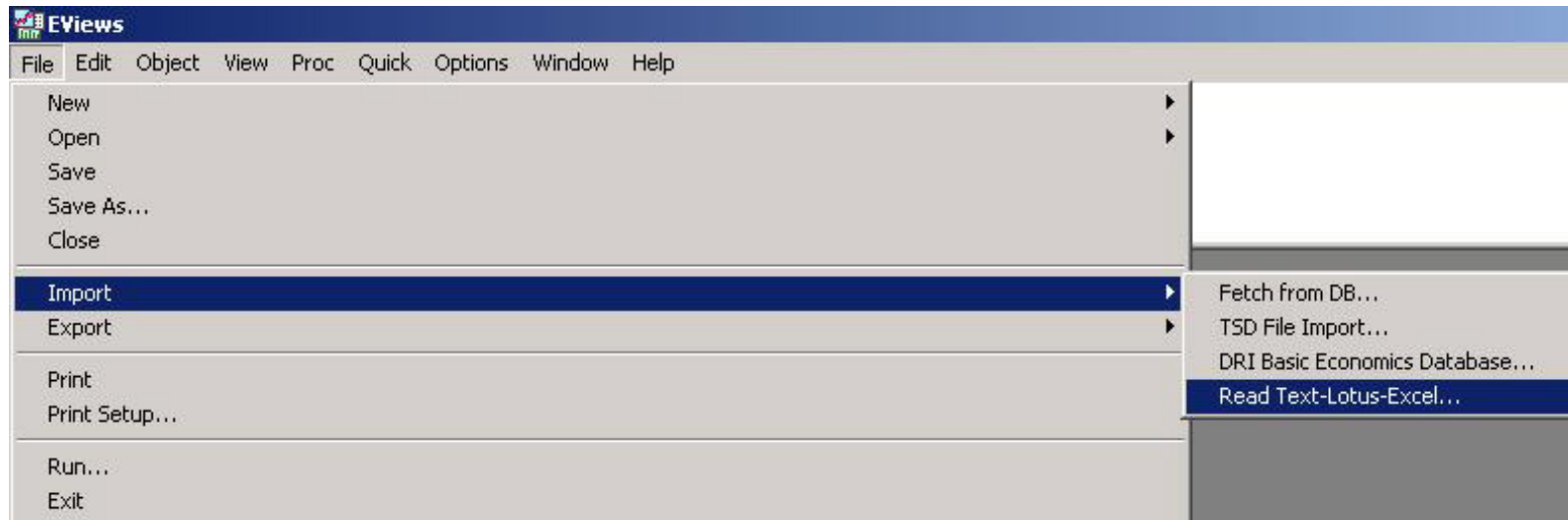
## 2.2 Importing Data: EViews

To upload such a series in an Eviews **Workfile**, proceed as follows

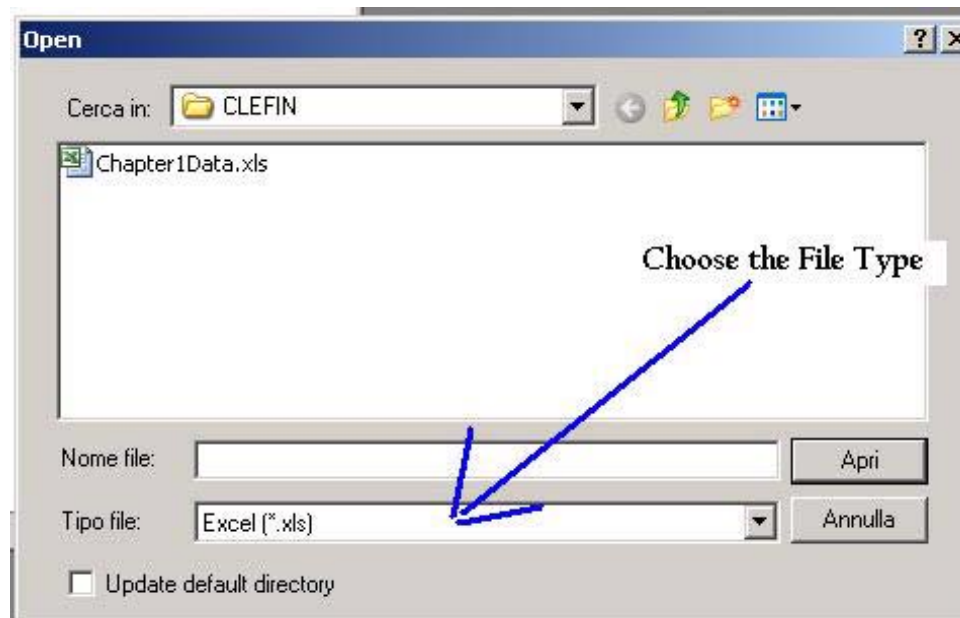
- go to Eviews and create a new Workfile paying attention on the frequency specification (**daily - 5 day week**)
- Specify the *start* and *end date* as follows *yyyy-mm-dd* (**1997-01-02 2001-12-31**)



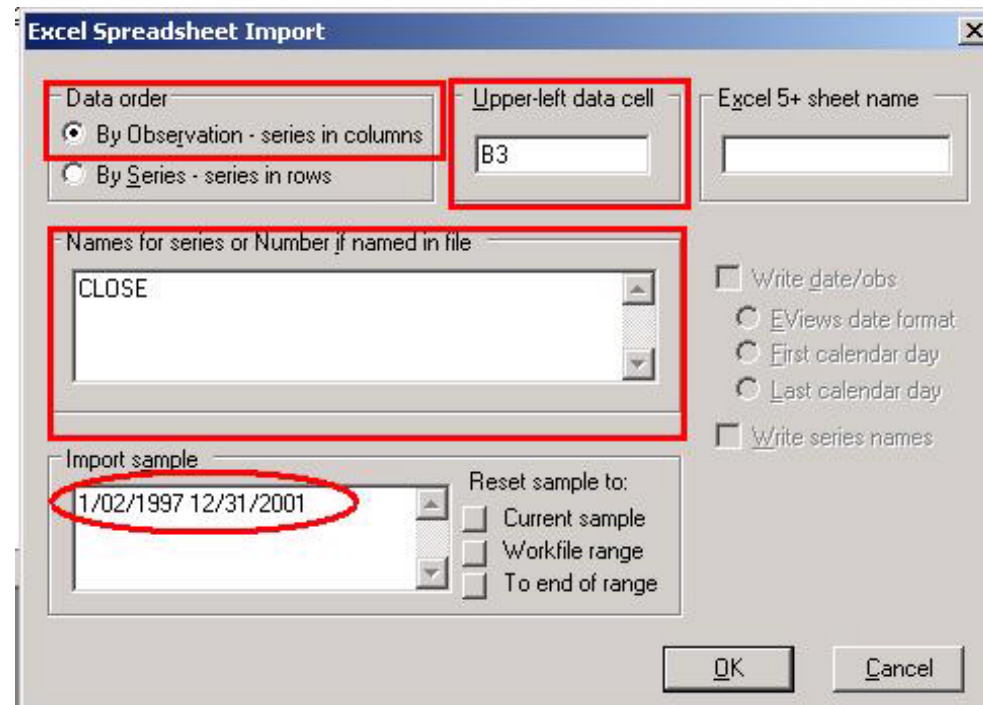
- Now we have a **daily Workfile**: *Save it*
  - Click on the button save to store it in the **Current Directory**
- We are ready to upload the data set from the Excel Sheet
  - go to *File->Import->Read Text-Lotus-Excel*



- Select the Excel File (Be sure, it isn't open in MS Excel!!!)

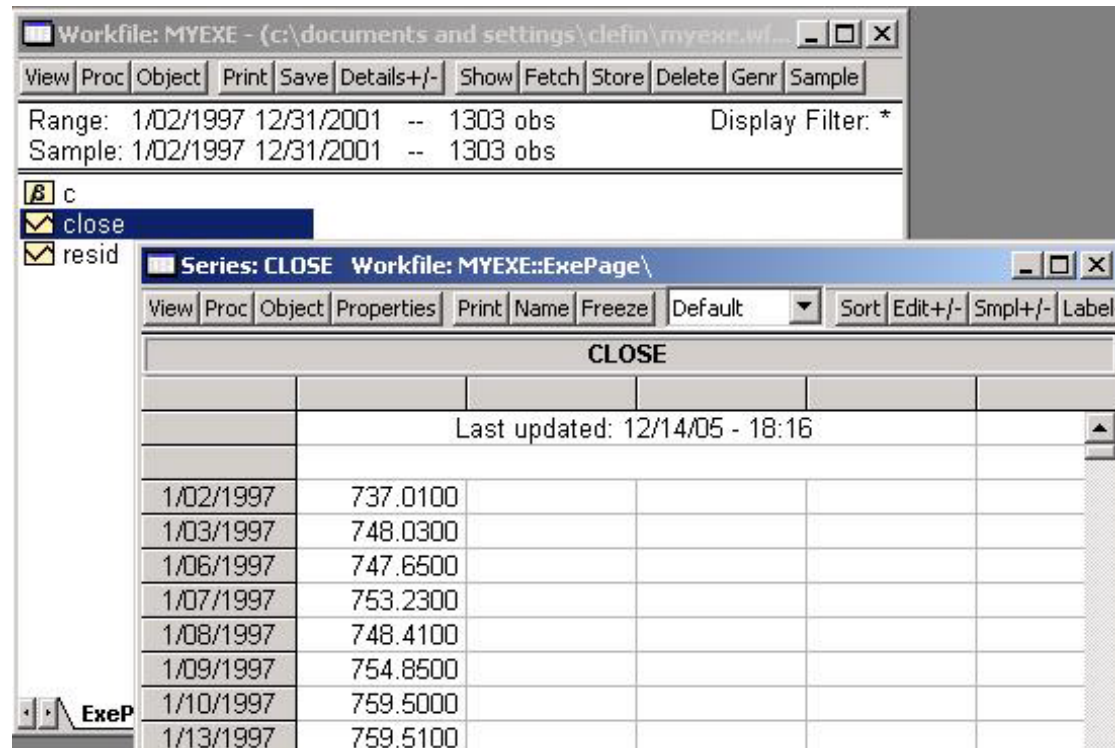


- Define the **Upper-Left Cell** of the Excel data set (in our case is **B3**)
- Note that observations in our time series are in column
- Write the name of the series your are importing (in our case **CLOSE** )



### 2.3 Importing Data: EViews Workfile

Here the time series in EViews



if you have more than one time series in Excel, the only thing you have to change in this procedure is the number of series names you have to put

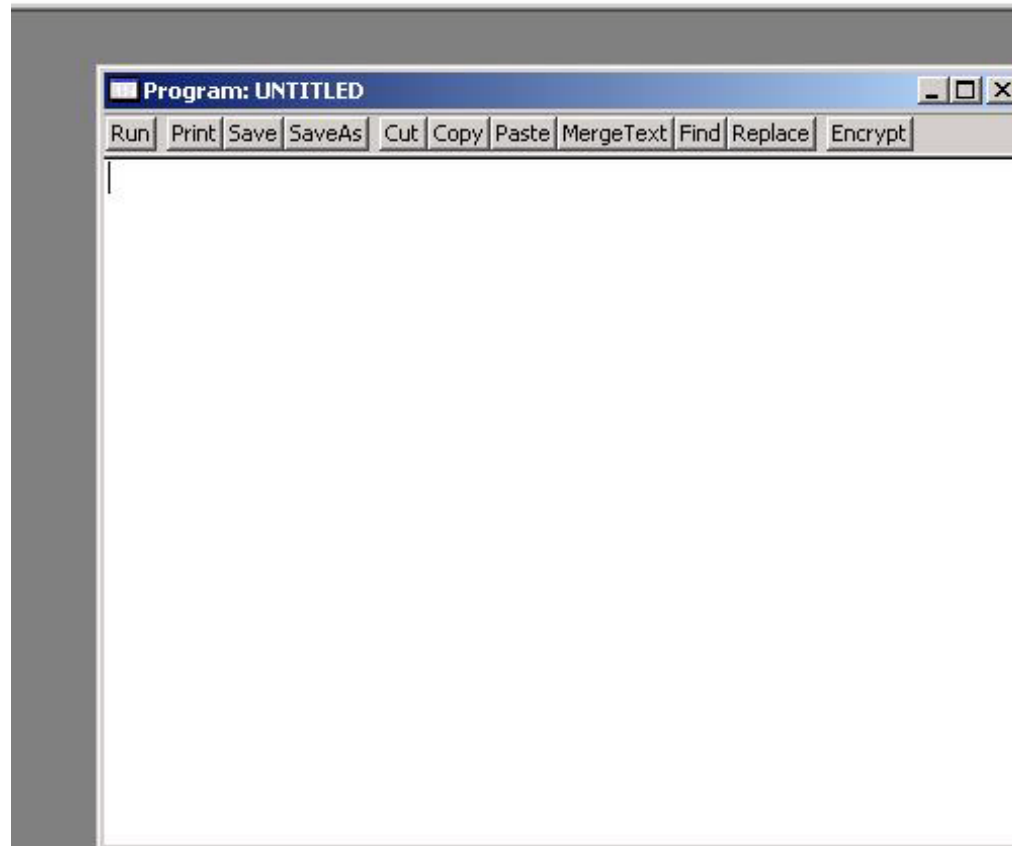
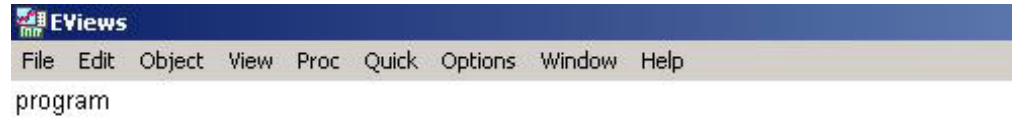
### 3 Programming in EViews

All the computations we are going to see in this course will be based on EViews programs. They are files which contain list of statements about generating series, make estimation and plotting charts. It is crucial to learn this machinery.

### 3.1 EViews Program Interface

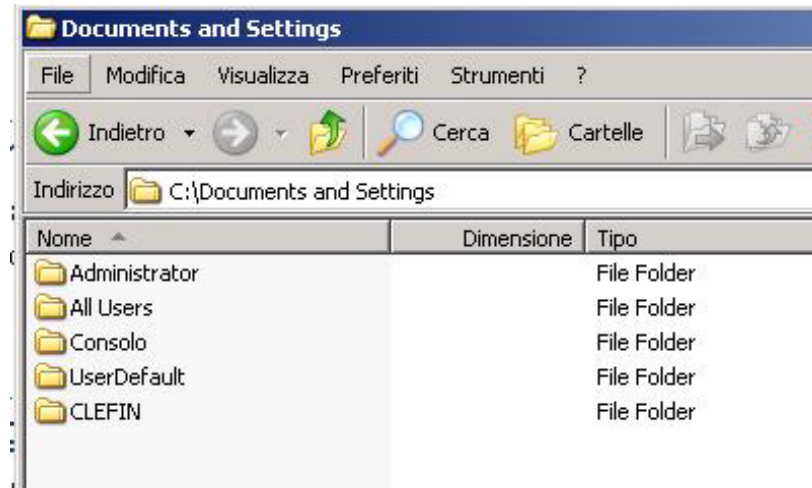
There is an alternative way to proceed in EViews instead of typing instructions on the **Command Window**. Such a procedure consists of writing a program file.

If you want to open a program file in EViews, go to *File->New->Program* or type **program** in the Command Window and press enter

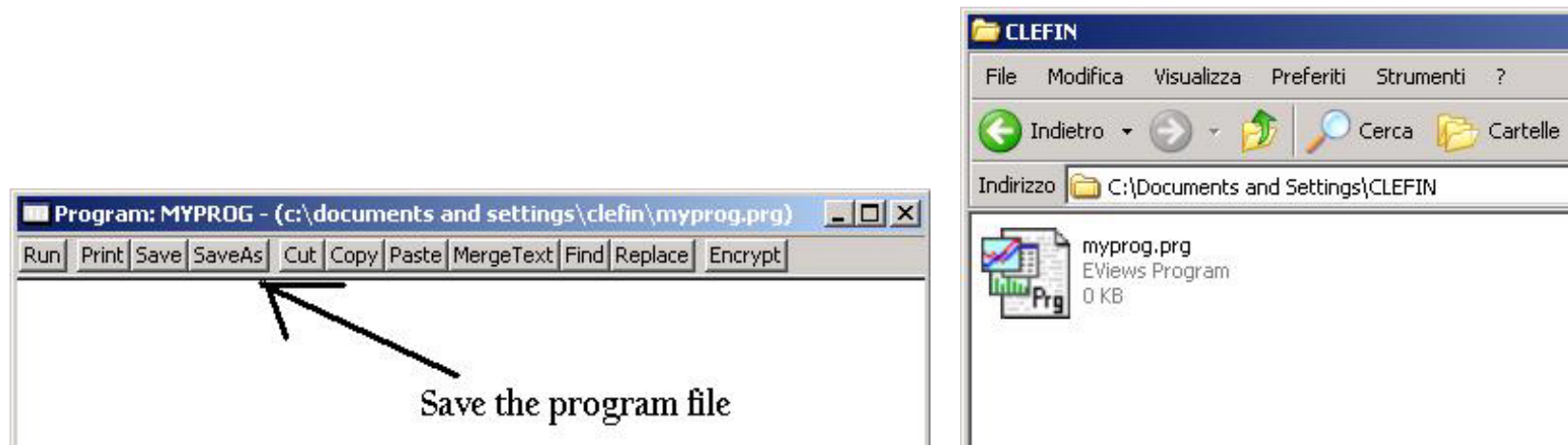


### 3.2 Current Directory

When you work with programs, it is important you specify the **Current Directory** (or **Working Directory**) where all the files are going to be uploaded and saved  
First of all, let us create a directory *C:\Documents and Settings\CLEFIN* as shown in the picture below



then we can go back to EViews and save our program file in such a director (*Name: MyProg and Extension: prg*)



We can now start writing in this EViews program file. Obviously, these notes are not exhaustive, but you can find more details in the EViews **Help**

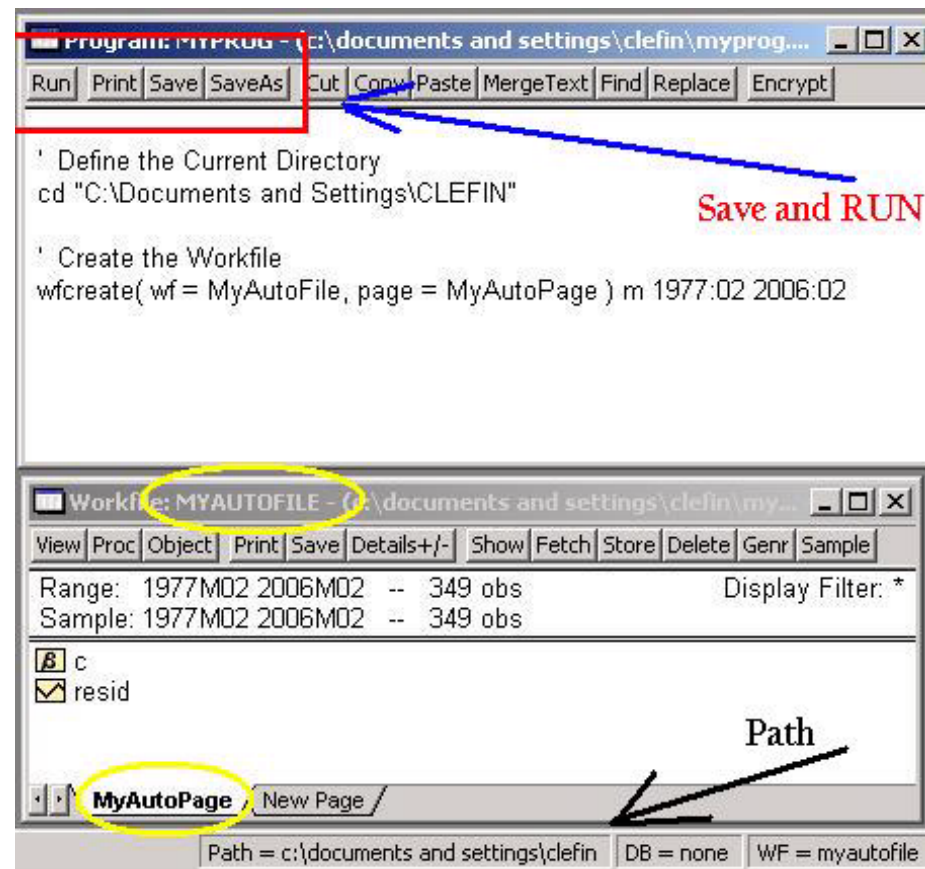
### 3.3 EViews Program: Creating and Saving a Workfile

The goal is to write and run a program which creates an EViews **Workfile**, generate some **series** and save the Workfile

Let us start writing into the program file **MyProg.prg**

- First of all we have to specify in which directory we want to save (and upload ) files
  - The command line is:
    - \* `cd "C:\Documents and Settings\CLEFIN"` (EViews updates the current path, bottom right bar)
- Secondly, we have to generate a workfile, with a certain frequency and sample period
  - The command line is
    - \* `wfcreate( wf = MyAutoFile, page = MyAutoPage ) m 1977:02 2006:02`
    - \* This commands create a Workfile named `MyAutoFile`, with the page named `MyAutoPage`; the frequency is defined by `m` (monthly), while the sample period starts in `1977:02` and ends in `2006:02`
- Remark: if we have to add few comments in the program file we can use the apostrophe at the beginning of the line
  - ' `This is your first program in EViews: Cross your fingers!!! :-)`

Now, *Save* and *Run* the Program by clicking on the buttons in the Program Window



The Program Window and The Workfile

### 3.4 Eviews Program: Generating Time Series

If we want to generate time series by using a program we just need to write commands which are very similar to what we have written in the **Command Window** such as

- `series hello = 1`
- `series ciao = nrnd`

and it is equivalent for vectors and scalars

- `scalar hola = 10`
- `vector(10,1) bonjour = hola`

Here, we also present how to deal with the *Sample Period*

- `series steps` (Define `steps` to be an empty series)
- `smp1 1977:2 1987:2`
- `steps = 10` (It equals 10 from Feb '77 to Feb '87)
- `smp1 1987:2 1997:2`
- `steps = 20` (It equals 20 from Feb '87 to Feb '97)
- `smp1 1997:2 2006:2`
- `steps = 8` (It equals 8 from Feb '97 to Feb '06)
- `smp1 @all` (It goes back to the full sample 1977:2 2006:2)

*SAVE* and *RUN* the program file

The screenshot displays two windows from the EViews software. The left window, titled "Program: MYPROG", contains the following code:

```
' Define the Current Directory
cd "C:\Documents and Settings\CLEFIN"

' Create the Workfile
wfccreate( wf = MyAutoFile, page = MyAutoPage ) m 1977:02 2006:02

' Generate Time Series
series hello = 1
series ciao = nrnd
scalar hola = 10
vector(10,1) bonjour = hola

' Working with the Sample Object
series steps
smpl 1977:2 1987:2
steps = 10
smpl 1987:2 1997:2
steps = 20
smpl 1997:2 2006:2
steps = 8

smpl @all
```

The right window, titled "Workfile: MYAUTOFILE", shows the workfile configuration and a list of series:

Range: 1977M02 2006M02 Filter: \*  
Sample: 1977M02 2006M02 -- 349 obs

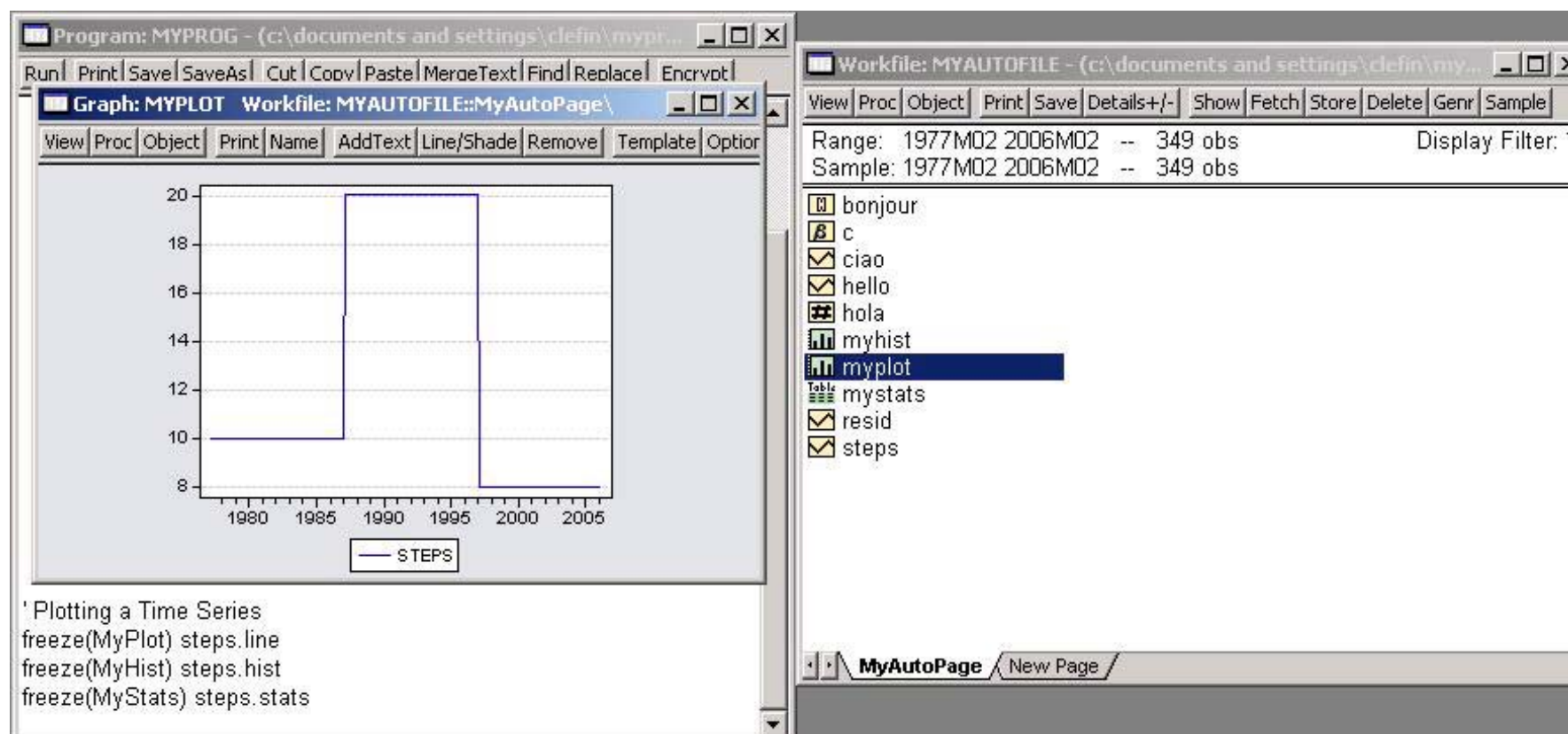
- bonjour
- c
- ciao
- hello
- hola
- resid
- steps

At the bottom of the workfile window, there are tabs for "MyAutoPage" and "New Page".

### 3.5 EViews Program: Creating Tables and Charts

Suppose now we want to draw a plot of the time series `steps`, or we want to calculate some descriptive statistics. We already know how to do that by using the Window Menu. An alternative way would be to use these commands in your program file

- `freeze(MyPlot) steps.line` (create and store a plot of `steps`)
- `freeze(MyHist) steps.hist` (create and store the empirical histogram of `steps`)
- `freeze(MyStats) steps.stats` (create and store the descriptive statistics of `steps`)



## 4 Empirical Exercise: Chapter One

The series we have previously uploaded, **CLOSE**, is the *closing price of the S&P500*

In chapter one of Christoffersen's Book, page 10, there is a list of exercises. Now we are going to implement them in Eviews

### 4.1 Exercise 1.1: Plot Prices and Returns

Command Window : `series s = close`

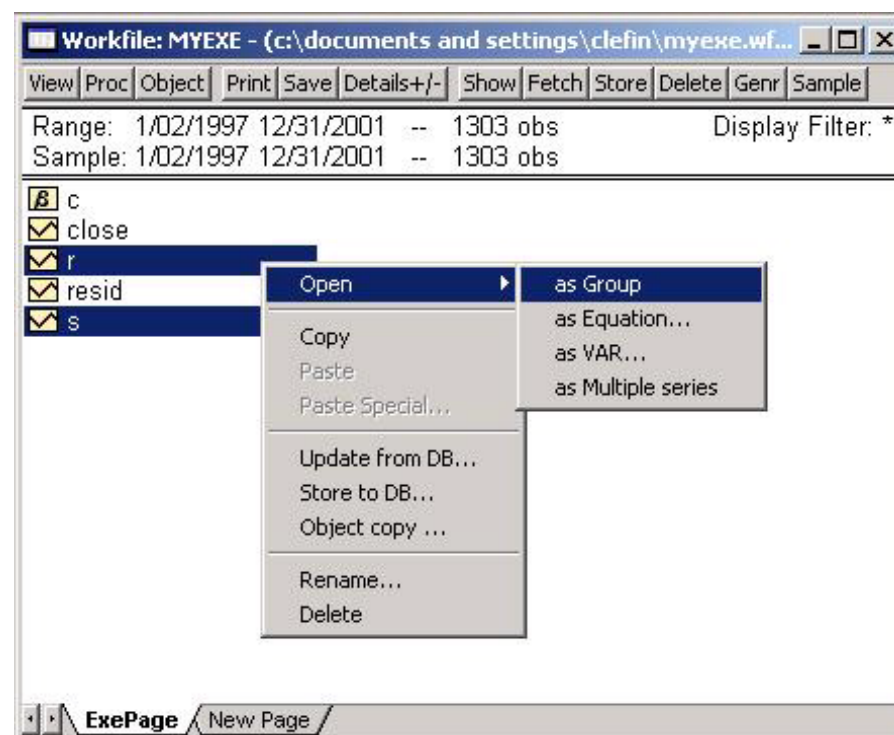
Command Window : `series r = log(s) - log(s(-1))`

Command Window : `show s r`

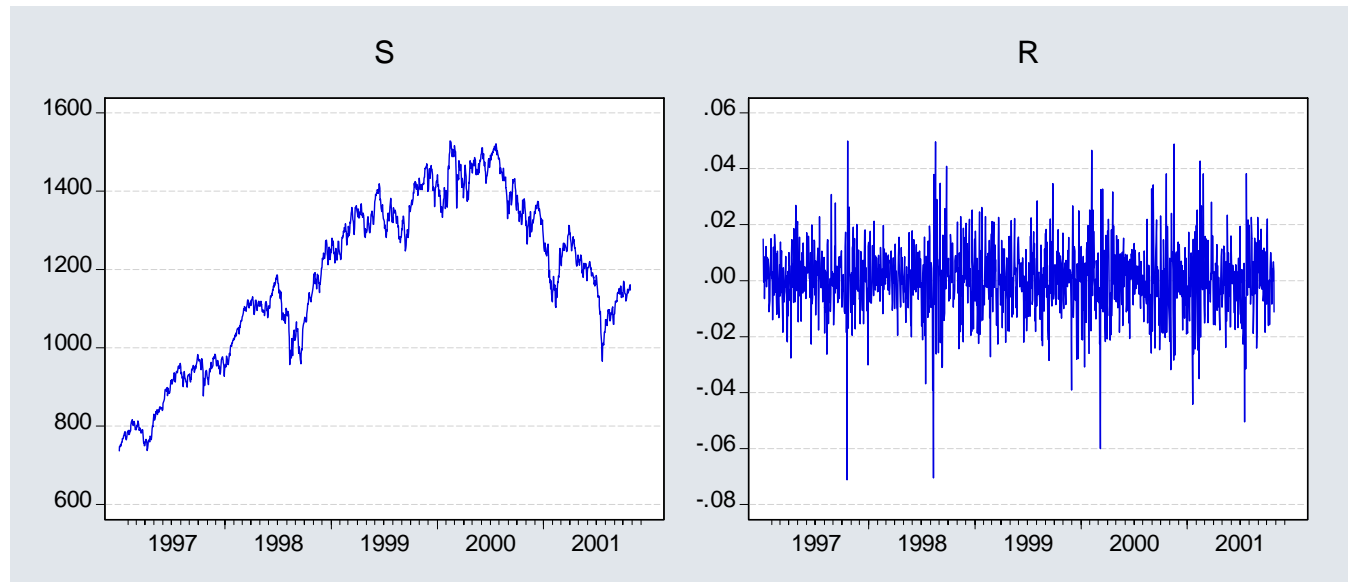
Command Window : `plot(m) s r`

An alternative way to plot the series is

- In the Workfile, select both series (use *CTRL Key*)
- Right click *Open*->*Group*
- *View*->*Multiple Graphs*->*Line*



- Here the plot



## 4.2 Exercise 1.2: Descriptive Statistics

Command Window : `s.hist`

Command Window : `r.hist`

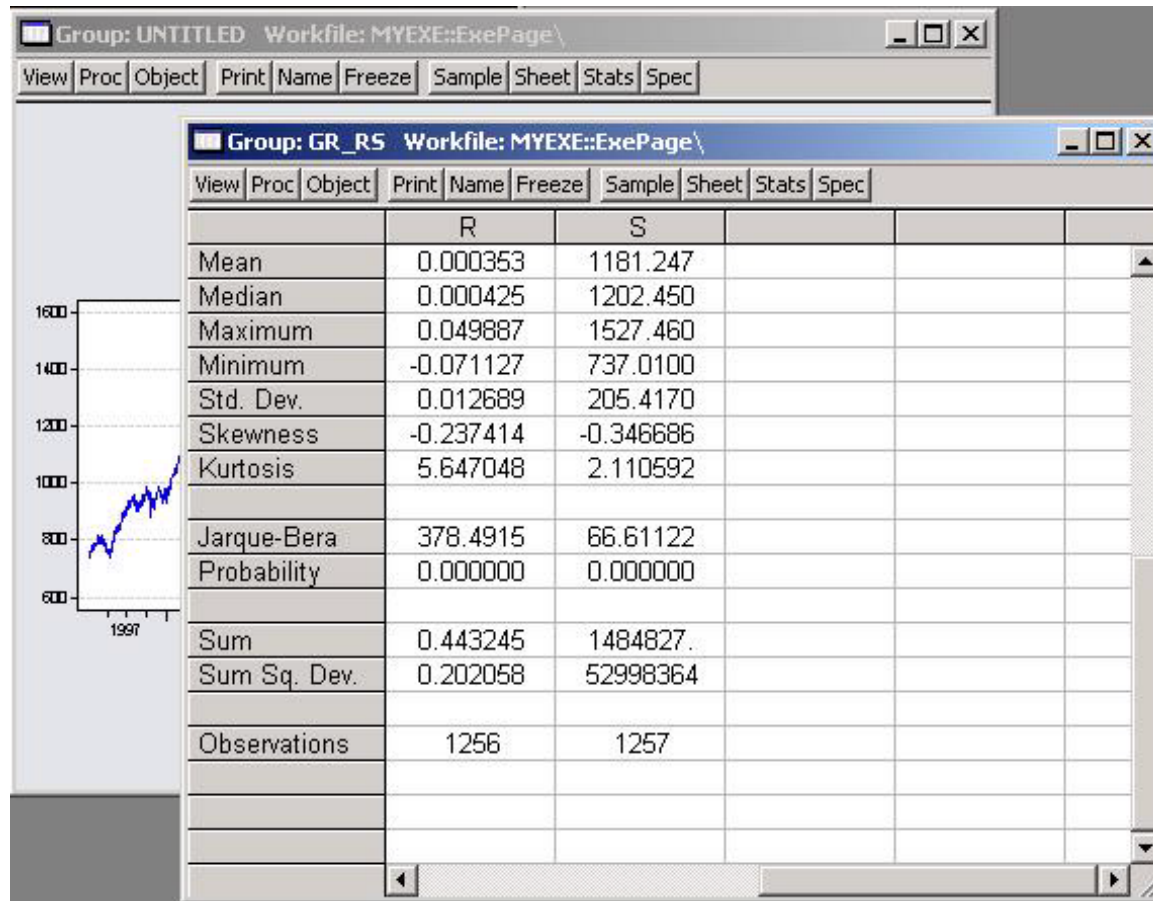
Command Window : `r.stats`

Command Window : `group gr_rs r s` (this command creates a group named `gr_rs`)

Command Window : `gr_rs.stats` (statistics for all the series in the group)

An alternative way to get these statistics is

- In the Workfile, select both series (use *CTRL Key*)
- Right click *Open->Group*
- *View->Descriptive Statistics->Individual Samples*



### 4.3 Exercise 1.3 - 1.4: Autocorrelation Function

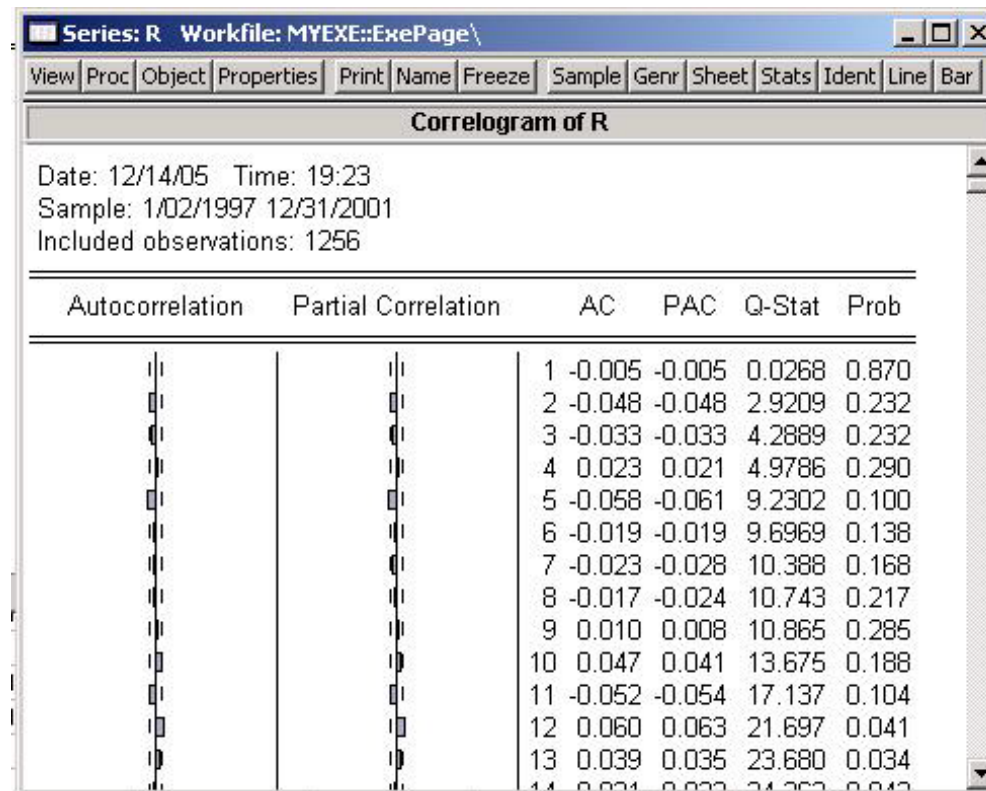
Command Window : series r2 = r^2

Command Window : r.correl(100)

Command Window : r2.correl(100)

An alternative way to get the autocorrelation function is

- In the Workfile, select the series
- *View->Correlogram->*
  - Choose "**Lags to Include**" equal to 100
  - Set "**Correlogram of** " equal to Level



#### 4.4 Exercise 1.5: Generate Conditional Variance

Command Window : `scalar var_r2 = @var(r2)`

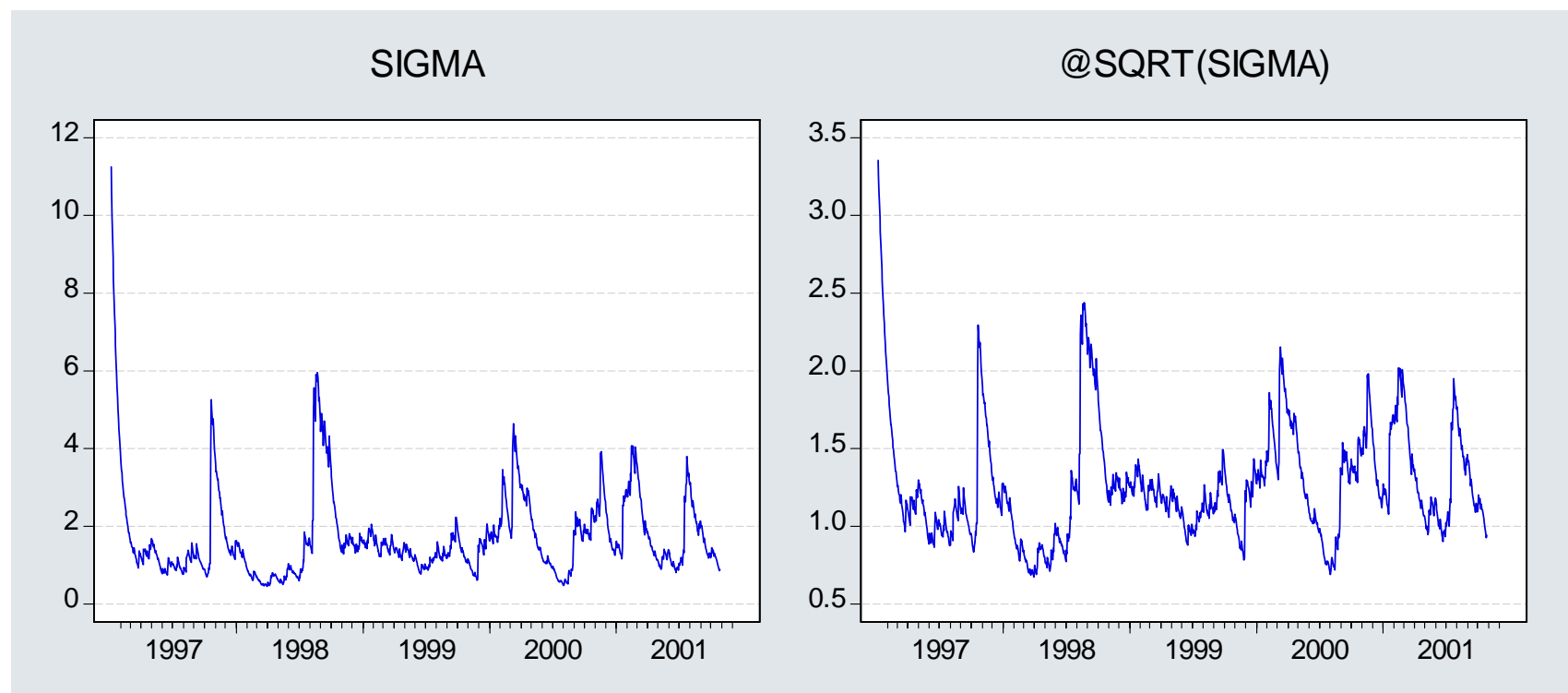
Command Window : `smp1 1997/01/03 1997/01/03` (We loose 1 obs to calculate Daily Returns)

Command Window : `series sigma = var_r2`

Command Window : `smp1 1997/01/06 @last`

Command Window : `series sigma = .94*sigma(-1) + .06*r2`

Command Window : `plot(m) sigma @sqrt(sigma)`



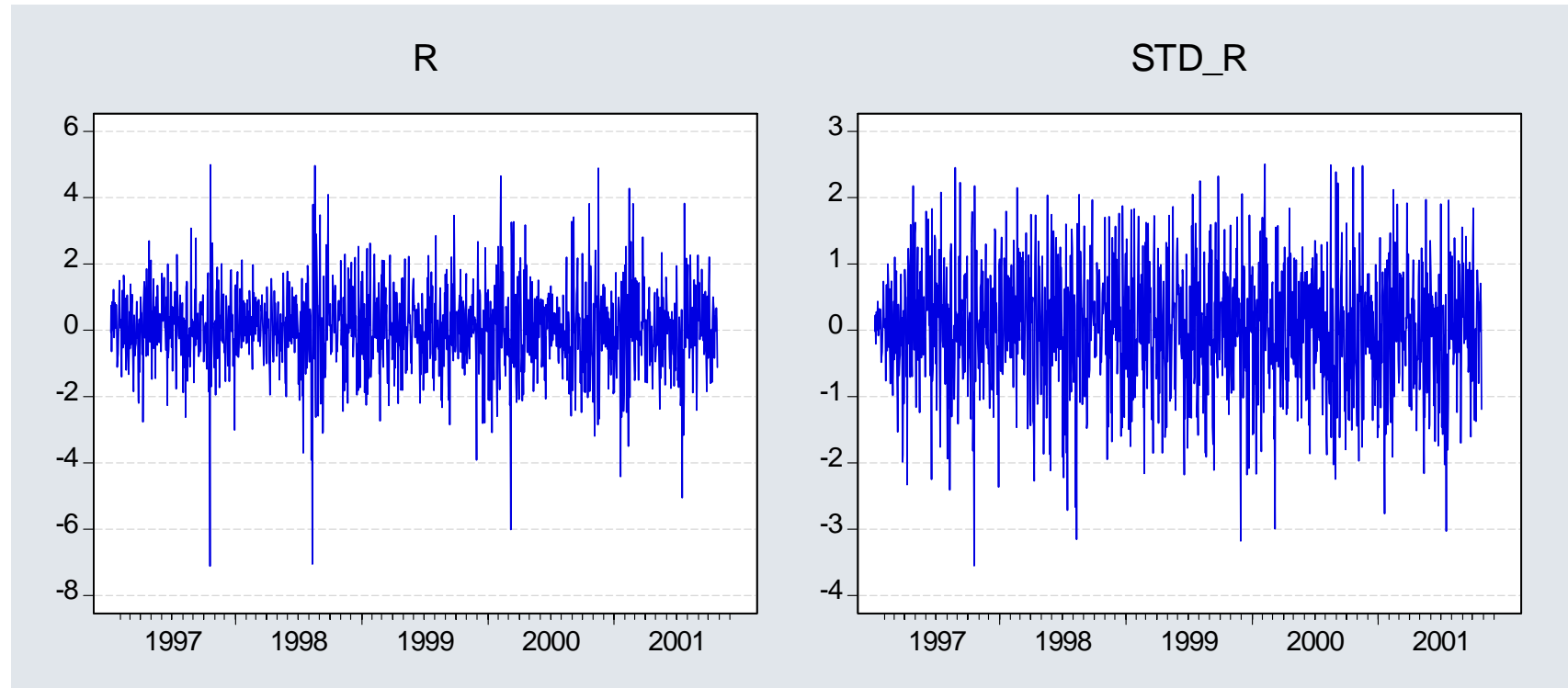
#### 4.5 Exercise 1.5: Standardized Returns

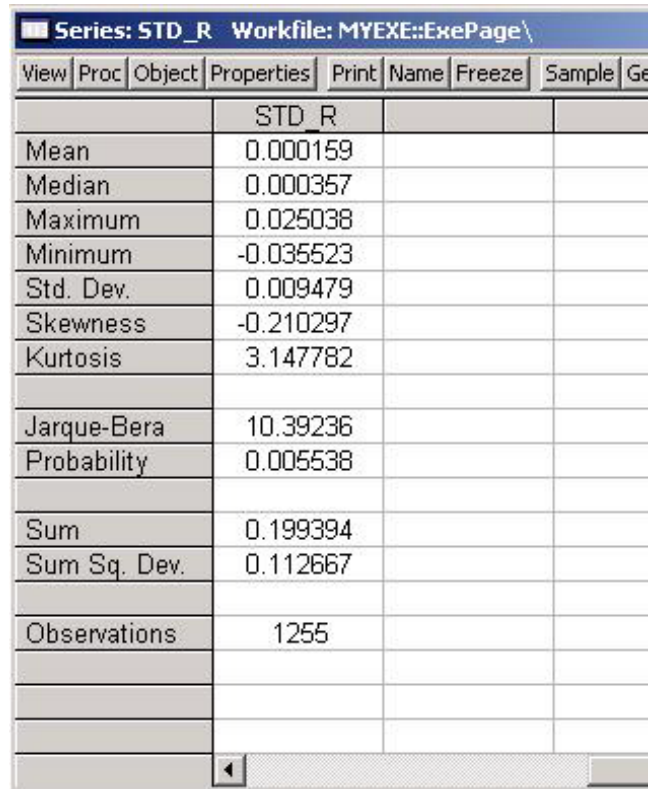
Command Window : `series sqrt_sigma = @sqrt(sigma)`

Command Window : `series std_r = r / sqrt_sigma`

Command Window : `plot(m) 100*r 100*std_r` (in percentage points)

Command Window : `std_r.stats`





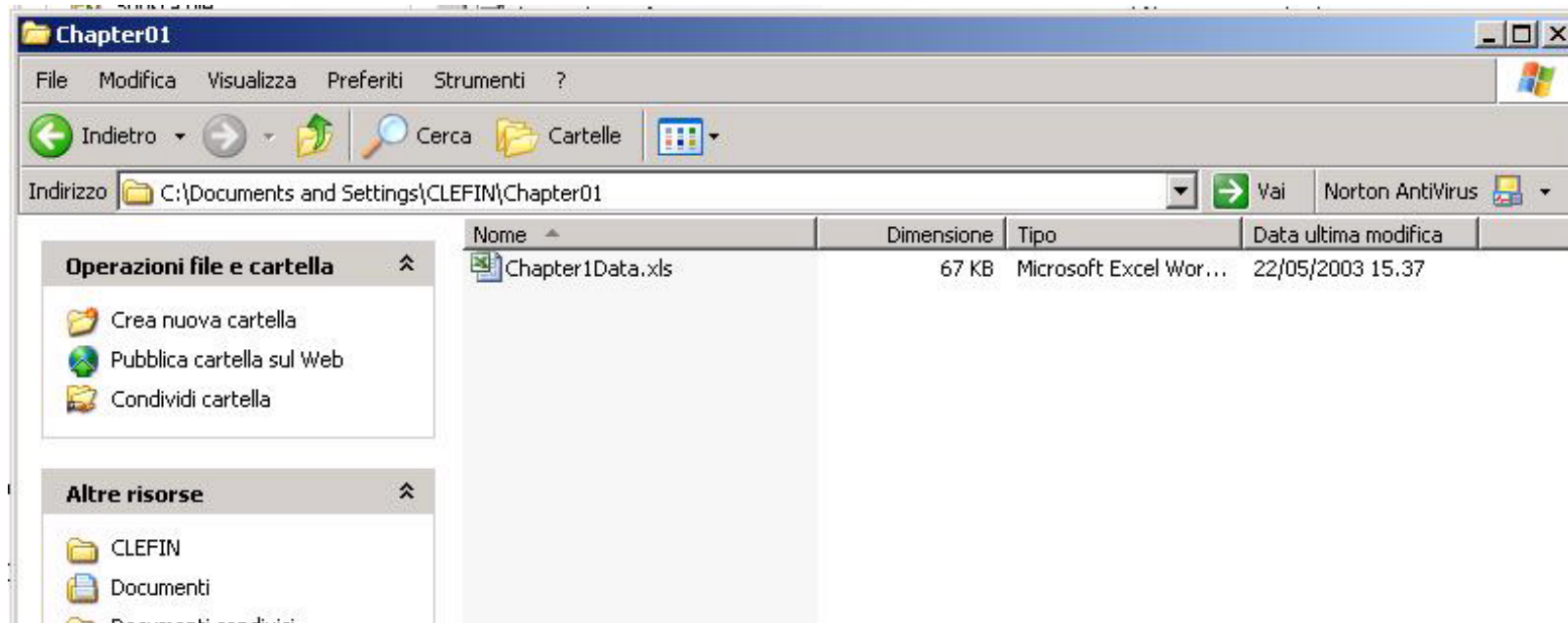
The screenshot shows a software window titled "Series: STD\_R Workfile: MYEXE::ExePage\". Below the title bar is a menu bar with options: View, Proc, Object, Properties, Print, Name, Freeze, Sample, and Ge. The main area contains a table with the following data:

|              | STD_R     |  |  |
|--------------|-----------|--|--|
| Mean         | 0.000159  |  |  |
| Median       | 0.000357  |  |  |
| Maximum      | 0.025038  |  |  |
| Minimum      | -0.035523 |  |  |
| Std. Dev.    | 0.009479  |  |  |
| Skewness     | -0.210297 |  |  |
| Kurtosis     | 3.147782  |  |  |
|              |           |  |  |
| Jarque-Bera  | 10.39236  |  |  |
| Probability  | 0.005538  |  |  |
|              |           |  |  |
| Sum          | 0.199394  |  |  |
| Sum Sq. Dev. | 0.112667  |  |  |
|              |           |  |  |
| Observations | 1255      |  |  |
|              |           |  |  |
|              |           |  |  |
|              |           |  |  |
|              |           |  |  |

## 5 Empirical Exercise: Chapter One - Batch Mode

### 5.1 Uploading The XLS File

- This is just a comment.
  - ' Chapter 1 - Exercises
- As usual, we need to specify the current directory. Assume (but you are free to choose any name you want) we create a directory named **Chapter01** in the folder *C:\Documents and Settings\CLEFIN* where we store our Excel file (*Chapter1Data.xls*)



- Now we have to set the current directory from where we want to upload the Excel file. This can be done with the following command and since the path contains some spaces, we have to use quotation marks

```
* cd "C:\Documents and Settings\CLEFIN\Chapter01"
```

- At this stage, we have to create the workfile
  - `wfcreate( wf = Chap01Data, page = Chap01 ) d 01/02/1997 10/26/2001`
- and to read the data set (we only read one time series)
  - `read( B3, s = Data ) Chapter1Data.xls 1`

These were the basic steps to create our own workfile. In the program **Chap01.prg** you can find several other commands which solve the exercise in chapter one.

## 5.2 The For Loop in Question #7

Any *for loop* has the following structure

```
for counter
  statement
next
```

```
scalar nobs = @obssmpl
group alldaily
```

```
' This Loop Computes Non-Overlapping Returns '
```

```
for %h 1 5 10 15
```

```
vector(nobs,1) daily{%h} = NA
series dly{%h} = 100 * ( log( y / y(-{%h}) ) )
```

```
  for !i = 1 to nobs step %h
    vector daily{%h}(!i) = @elem( dly{%h} , @otod(!i) )
  next
```

```
mtos( daily{%h}, sdaily{%h} )
alldaily.add sdaily{%h}
```

```
sdaily{%h}.stats
```

```
next
```

```
alldaily.stats
```

### 5.2.1 Two Examples

This example creates four series named (GAUSS1, GAUSS2, GAUSS3, GAUSS4) which are random draws from a Normal distribution with different moments

$$e \sim N(0, 1) \tag{1}$$

$$Gauss1 = 1 + e \sim N(1, 1) \tag{2}$$

$$Gauss2 = 2 + \sqrt{2}e \sim N(2, 2) \tag{3}$$

$$Gauss3 = 3 + \sqrt{3}e \sim N(3, 3) \tag{4}$$

```
for !j = 1 to 4
  series gauss{!j} = !j + @sqrt(!j) * @nrnd
next
```

while an alternative *for loop* over a string variable reads

```
for %h 3 4
  series laplace{%h} = gauss{%h}
next
```

1. vector `daily{%h}(!i)` for  $h = 15$  and  $i = 100$  refers to the *100th* entry of the vector **daily15**
2. `@elem( dly{%h} , @otod(!i) )` for  $h = 15$  and  $i = 100$  takes the *100th* element in the series **dly15**; we use `@otod()`<sup>1</sup> because we want to know to what corresponds, in terms of calendar date, the *100th* value.
3. the command **mtos** transforms a matrix or vector into a series object

For the commands left unexplained, please see the EViews Help.

---

<sup>1</sup>`@otod` means going from **observations to** calendar **date**.