EViews 3.1

Student Version

QUANTITATIVE
MICRO SOFTWARE

EViews 3.1 Student Version

Disclaimer

The authors and Quantitative Micro Software assume no responsibility for any errors that may appear in this manual or the EViews program. The user assumes all responsibility for the selection of the program to achieve intended results, and for the installation, use, and results obtained from the program.

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Quantitative Micro Software, LLC
4521 Campus Drive, #336, Irvine CA, 92612-2699
Telephone: (949) 856-3368
Fax: (949) 856-2044
e-mail: sales@eviews.com
web: **www.eviews.com**

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Chapter 1. Introduction (Student Version)

What Is EViews?

EViews provides sophisticated data analysis, regression, and forecasting tools on Windows-based computers. With EViews you can quickly develop a statistical relation from your data and then use the relation to forecast future values of the data. Areas where EViews can be useful include: scientific data analysis and evaluation, financial analysis, macroeconomic forecasting, simulation, sales forecasting, and cost analysis.

EViews is a new version of a set of tools for manipulating time series data originally developed in the Time Series Processor software for large computers. The immediate predecessor of EViews was MicroTSP, first released in 1981. Though EViews was developed by economists and most of its uses are in economics, there is nothing in its design that limits its usefulness to economic time series. Even quite large cross-section projects can be handled in EViews.

EViews provides convenient visual ways to enter data series from the keyboard or from disk files, to create new series from existing ones, to display and print series, and to carry out statistical analysis of the relationships among series.

EViews takes advantage of the visual features of modern Windows software. You can use your mouse to guide the operation with standard Windows menus and dialogs. Results appear in windows and can be manipulated with standard Windows techniques.

The remainder of this chapter discusses the differences between the Student Version and the full versions of EViews, outlines the installation procedure, provides a brief tutorial on Windows, describes the basic components of the EViews window, and describes sources for additional help. Feel free to breeze through or skip over whatever parts you wish, but we *strongl* recommend that you familiarize yourself with the sections on the EViews Window and the Help System.

EViews Student Version

Your EViews Student Version is a modified version of EViews 3.1 that differs along several dimensions. First, your CD-ROM disc *must be inserted in a drive in order to start the program*. Second, there are capacity restrictions which limit the size of projects that may be handled by EViews Student Version. Third, the Student Version lacks some of EViews' more advanced analytical and programming features. Lastly, EViews Student Version includes a limited set of printed documentation and restricted techni-

cal support. In all other respects, the Student Version is identical to the professional version of EViews.

Below, we introduce you to some basic concepts and describe features of the EViews Student Version that differ from the full version. In the event that something in EViews does not work as anticipated, be sure to refer to this section to determine whether the differences are due to inherent limitations of the Student Version.

Features not Supported in EViews Student Version

The following features are not available in the Student Version:

- X-11 seasonal adjustment. Seasonal adjustment by the ratio-to-moving average and difference-from-moving average techniques *are included*.
- Generalized Method of Moments (GMM) and State Space estimation.
- ARCH estimation and forecasting.
- System estimation by Seemingly Unrelated Regression, Three-Stage Least Squares, GMM and FIML.
- Advanced discrete and limited dependent variables estimators (censored and tobit estimation, ordered response, and count models). The binary estimators (probit, logit, gompit) *are* included.
- While EViews Student Version can read from and write to the standard EViews workfile, it provides only read access to EViews advanced databases. You cannot create new databases or write to existing databases with the Student Version. Furthermore, access to the DRI Basic Economics Database and the Haver databases is not provided.
- Programming Capabilities. EViews 3.1 contains an advanced programming language that allows you to write and execute sophisticated programs in batch mode. The Student Version is limited to interactive use.
- Matrix Operations. The standard version of EViews 3.1 provides an extensive set of functions for matrix algebra and manipulation that is *not* available in the Student Version.

EViews Student Version Capacity Limitations

The biggest difference between standard versions of EViews and the EViews Student Version is in the size of projects that may be undertaken. The Student Version places limits on the number of observations per series, the total number of observations across all series, and the number of objects (series, graphs, equations, etc.) in a workfile.

The following table lists the current capacity limitations of the two versions of EViews:

	EViews 3.1 32 bit	Student Version
Maximum observations per series	4,000,000	1,000
Total observations: series x obs. per series	limited by available RAM	10,000
Maximum objects per workfile	limited by available RAM	50

EViews Student Version Documentation

The EViews Student Version is supplied with a single manual, the *EViews Student Version User's Guide*, while the full version of EViews 3.1 is supplied with both a full *User's Guide* and an additional manual, the *Command and Programming Reference*. The *Command and Programming Reference* is designed to document the command language and the advanced programming features of the program that are not available in the Student Version.

Though we have not provided a printed version of the *User's Guide*, your CD-ROM does include an Adobe Portable Document Format (.PDF) file containing the full *User's Guide*. This PDF file is fully indexed, and contains hypertext links to aid you in navigating through the file. We have also provided a copy of Adobe Acrobat Reader 4.0, which will allow you to read and print the PDF file. In addition, your EViews Student Version also contains an extensive Windows on-line help system that contains the entire help system found in EViews 3.1. Further details are provided below, and on your CD-ROM.

All basic EViews commands which are supported in EViews Student Version are fully documented in the *User's Guide* or the EViews Help System.

Student Version Technical Support

Registered users of EViews 2.0 and EViews 3.1 are entitled to technical support on matters related to the installation and operation of EViews. Unfortunately, due to the nature of this product, we are unable to provide equivalent Student Version technical support. Questions regarding the *operation* of the software should be directed to your instructor or computer administrator.

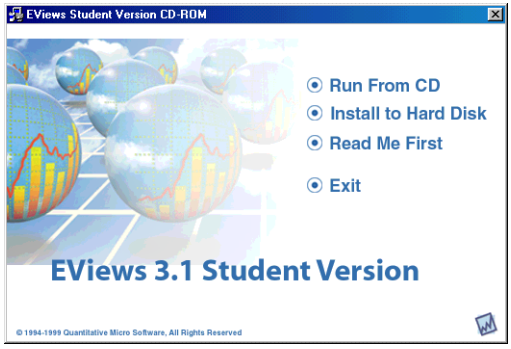
Installing and Running EViews Student Version

You may run EViews Student Version directly from the CD-ROM or you can first install the program on your hard disk, and then run it from the installed location. Installing the program will allow EViews Student Version to start-up faster, at the cost of using up some space on your hard disk.

Before beginning the installation procedure, you should make certain that your computer satisfies the following requirements:

- A computer running Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).
- At least 32 megabytes of random access memory (RAM).
- A VGA, super VGA, or compatible display.
- A Windows compatible mouse or trackball.
- A CD-ROM compatible drive.

To install or run EViews Student Version, simply insert the CD-ROM disc in your drive. Wait briefly while the disc spins-up and the Setup program launches. If your disc does not spin-up, navigate to the drive using Windows Explorer, then click on the Setup icon.



Once the Setup program opens, a navigation screen appears asking whether you wish to install the Student Version on your hard drive, whether you wish to run the program from CD-ROM, or whether you wish to exit the setup program. Clicking on **Run From CD** will start EViews by loading the necessary files directly from the CD. Note that if you choose to run from the CD-ROM, you should not remove the CD-ROM disc until you have exited from the program.

Alternatively, selecting **Install to Hard Disk** will write the primary program files, help files, and support files to your hard drive. Installing the program on your hard drive will use up disk space (roughly 10 megabytes), but will reduce subsequent program startup time. Once you have installed the Student Version to your hard drive, the setup program will prompt you to run the program from the hard disk. Simply click on the menu item **Run** to launch the program.

If the CD-ROM is not present in a drive, you will be prompted to insert the disc. *The disc must be present in a drive, even if the Student Version has already been installed on the hard drive.* The one exception to this requirement is given to laptop machines without CD-ROM drives.

Be certain to click on **Read Me First** for additional information, and last-minute updates to the printed documentation and help system. The Read Me document will also provide you with a guide to using the PDF documentation files that are provided on your CD-ROM.

Windows Basics

In this section, we provide a brief discussion of some useful techniques, concepts, and conventions that we will use in this manual. We urge those who desire more detail to obtain one of the (many) very good books on Windows.

The Mouse

EViews uses both buttons of the standard Windows mouse. Unless otherwise specified, when we say that you should *click* on an item, we mean a single click of the left mouse-button. *Double-click* means to click the left mouse-button twice in rapid succession. We will often refer to *dragging* with the mouse; this means that you should click and hold the left mouse-button down while moving the mouse.

Window Control

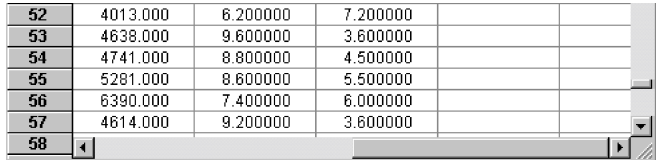
As you work, you may find that you wish to change the size of a window or temporarily move a window out of the way. Alternatively, a window may not be large enough to display all of your output, so that you want to move within the window in order to see relevant items. Windows provides you with methods for performing each of these tasks.

Changing the active window

When working in Windows, you may find that you have a number of open windows on your screen. The *active* (top-most) *window* is easily identified since its title bar will generally differ (in color and/or intensity) from the inactive windows. You can make a window active by clicking anywhere in the window, or by clicking on the word **Window** in the main menu, and selecting the window by clicking on its name.

Scrolling

Windows provides both horizontal and vertical *scroll bars* so that you can view information which does not fit inside the window (when all of the information in a window fits inside the viewable area, the scroll bars will be hidden).



52	4013.000	6.200000	7.200000		
53	4638.000	9.600000	3.600000		
54	4741.000	8.800000	4.500000		
55	5281.000	8.600000	5.500000		
56	6390.000	7.400000	6.000000		
57	4614.000	9.200000	3.600000		
58					

The scroll box indicates the overall relative position of the window and the data. Here, the vertical scroll box is near the bottom, indicating that the window is showing the lower portion of our data. The size of the box also changes to show you the relative sizes of the amount of data in the window and the amount of data that is offscreen. Here, the current display covers roughly half of the horizontal contents of the window.

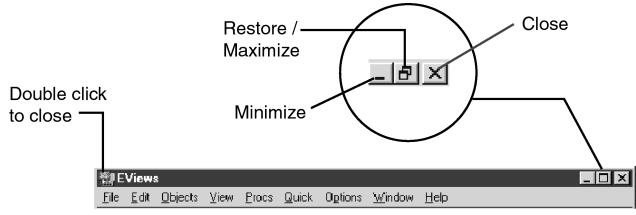
Clicking on the up, down, left, or right scroll arrows on the scroll bar will scroll the display one line in that direction. Clicking on the scroll bar on either side of a scroll box moves the information one screen in that direction.

If you hold down the mouse button while you click on or next to a scroll arrow, you will scroll continuously in the desired direction. To move quickly to any position in the window, drag the scroll box to the desired position.

Minimize/Maximize/Restore/Close

There may be times when you wish to move EViews out of the way while you work in another Windows program. Or you may wish to make the EViews window as large as possible by using the entire display area.

In the upper right-hand corner of each window, you will see a set of buttons which control the window display:



By clicking on the middle (Restore/Maximize) button, you can toggle between using your entire display area for the window, and using the original window size. *Maximize* (🗖) uses your entire monitor display for the application window. *Restore* (🗗) returns the window to its original size, allowing you to view multiple windows. If you are already using the entire display area for your window, the middle button will display the icon for restoring the window, otherwise it will display the icon for using the full screen area.

You can *minimize* your window by clicking on the minimize button in the upper right-hand corner of the window. To *restore* a program that has been minimized, click on the icon in your taskbar.

Lastly, the *close* button provides you with a convenient method for closing the window. To close all of your open EViews windows, you may also select **Window** in the main menu, and either **Close All**, or **Close All Objects**.

Moving and Resizing

You can move or change the size of the window (if it is not maximized or minimized). To move your window, simply click on the title bar (the top of your application window) and drag the window to a new location. To resize, simply put the cursor on one of the four sides or corners of

the window. The cursor will change to a double arrow. Drag the window to the desired size, then release the mouse button.

Selecting and Opening Items

To select a single item, you should place the pointer over the item and single click. The item will now be highlighted. If you change your mind, you can change your selection by clicking on a different item, or you can cancel your selection by clicking on an area of the window where there are no items.

You can also select multiple items:

- To select sequential items, click on the first item you want to select, then drag the cursor to the last item you want to select and release the mouse button. All of the items will be selected. Alternatively, you can click on the first item, then hold down the SHIFT key and click on the last item.
- To select non-sequential items, click on the first item you want to select, then while holding the CTRL key, click on each additional item.
- You can also use CTRL-click to "unselect" items which have already been selected. In some cases it may be easier first to select a set of sequential items and then to unselect individual items.

Double clicking on an item will usually open the item. If you have multiple items selected, you can double click anywhere in the highlighted area.

Menus and Dialogs

Windows commands are accessed via *menus*. Most applications contain their own set of menus, which are located on the menu bar along the top of the application window. There are generally drop-down menus associated with the items in the main menu bar.

For example, the main EViews menu contains:

Selecting **File** from this menu will open a drop-down menu containing additional commands. We will describe the EViews menus in greater detail in the coming sections.

There are a few conventions which Windows uses in its menus that are worth remembering:

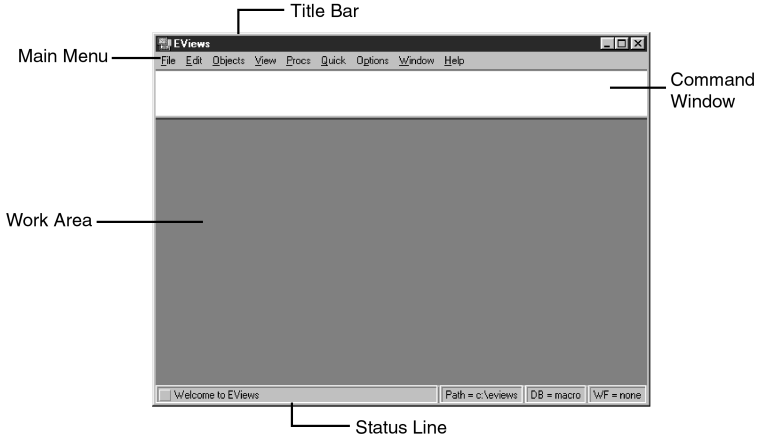
- A grayed-out command means the command is not currently available.
- An ellipse (…) following the command means that a dialog box (prompting you for additional input) will appear before the command is executed.

- A right-triangle (‣) means that additional (cascading) menus will appear if you select this item.
- A check mark (✔) indicates that the option listed in the menu is currently in effect. If you select the item again, the option will no longer be in effect and the check mark will be removed. This behavior will be referred to as *toggling*.
- Most menu items contain underlined characters representing keyboard shortcuts. You can use the keyboard shortcuts to the commands by pressing the ALT key, and then the underlined character. For example ALT-F in EViews brings up the **File** drop-down menu.
- If you wish to close a menu without selecting an item, simply click on the menu name, or anywhere outside of the menu. Alternatively, you can press the ESC key.

We will often refer to entering information in *dialogs*. Dialogs are boxes that prompt for additional input when you select certain menu items. For example, when you select the menu item to run a regression, EViews opens a dialog prompting you for additional information about the specification, and often suggests default values for arguments. You can always tell when a menu item opens a dialog by the ellipses in the drop-down menu entry.

The EViews Window

If the program is correctly installed, you should see the EViews window when you launch the program. This is what the EViews window looks like:



You should familiarize yourself with the following main areas in the EViews Window.

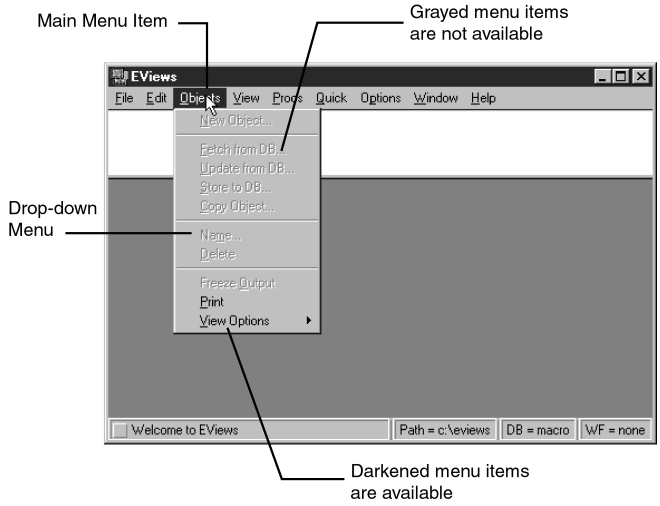
The Title Bar

The *title bar*, labeled **EViews Student Version**, is at the very top of the main window. When EViews is the active program in Windows, the title bar has a color and intensity that differs from

the other windows (generally it is darker). When another program is active, the EViews title bar will be lighter. If another program is active, EViews may be made active by clicking anywhere in the EViews window or by using ALT-TAB to cycle between applications until the EViews window is active.

The Main Menu

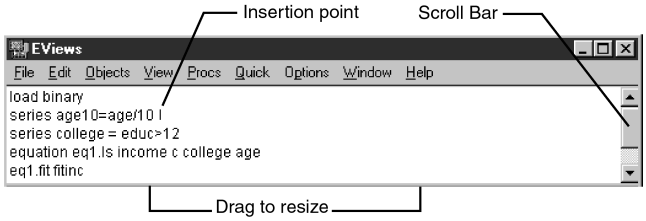
Just below the title bar is the *main menu*. If you move the cursor to an entry in the main menu and click on the left mouse button, a *drop-down menu* will appear. Clicking on an entry in the drop-down menu selects the highlighted item.



For example, here we click on the Objects entry in the main menu to reveal a drop-down menu. Notice that some of the items in the drop-down are listed in black and others are in gray. In menus, black items may be executed while the gray items are not available. In this example, you cannot create a **New Object** or **Store** an object, but you can **Print** and **View Options**. We will explain this behavior in our discussion of "The Object Window" on page 41 of Chapter 3.

The Command Window

Below the menu bar is an area called the *command window*. EViews commands may be typed in this window. The command is executed as soon as you hit ENTER.



The vertical bar in the command window is called the *insertion point*. It shows where the letters that you type on the keyboard will be placed. As with standard word processors, if you have typed something in the command area, you can move the insertion point by pointing to the new location and clicking the mouse. If the insertion point is not visible, it probably means that the command window is not active; simply click anywhere in the command window to tell EViews that you wish to enter commands.

You can move the insertion point to previously executed commands, edit the existing command, and then press ENTER to execute the edited version of the command.

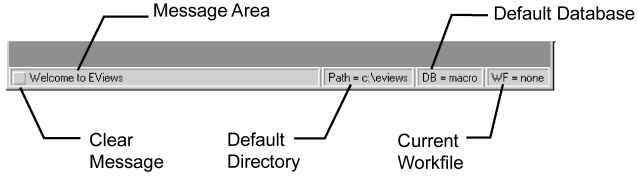
The command window supports Windows cut-and-paste so that you can easily move text between the command window, other EViews text windows, and other Windows programs. The contents of the command area may also be saved directly into a text file for later use: make certain that the command window is active by clicking anywhere in the window, and then select **File/Save As…** from the main menu.

If you have entered more commands than will fit in your command window, EViews turns the window into a standard scrollable window. Simply use the scroll bar or up and down arrows on the right-hand side of the window to see various parts of the list of previously executed commands.

You may find that the default size of the command window is too large or small for your needs. You can resize the command window by placing the cursor at the bottom of the command window, holding down the mouse button and dragging the window up or down. Release the mouse button when the command window is the desired size.

The Status Line

At the very bottom of the window is a *status line* which is divided into several sections.



The left section will sometimes contain status messages sent to you by EViews. These status messages can be cleared manually by clicking on the box at the far left of the status line. The

next section shows the *default directory* that EViews will use to look for data and programs. The last two sections display the names of the default database and workfile. In later chapters, we will show you how to change both defaults.

The Work Area

The area in the middle of the window is the work area where EViews will display the various object windows that it creates. Think of these windows as similar to the sheets of paper you might place on your desk as you work. The windows will overlap each other with the foremost window being in focus or active. Only the active window has a darkened titlebar.

When a window is partly covered, you can bring it to the top by clicking on its titlebar or on a visible portion of the window. You can also cycle through the displayed windows by pressing the F6 or CTRL-TAB keys.

Alternatively, you may select a window by clicking on the **Window** menu item, and selecting the desired name.

You can move a window by clicking on its title bar and dragging the window to a new location. You can change the size of a window by clicking on any corner and dragging the corner to a new location.

Closing EViews

There are a number of ways to close EViews. You can always select **File/Exit** from the main menu, or you can press ALT-F4. Alternatively, you can click on the close box in the upper right-hand corner of the EViews window, or double click on the EViews icon in the upper left-hand corner of the window. If necessary, EViews will warn you and provide you with the opportunity to save any unsaved work.

Where To Go For Help

The Student Version Manual

The remainder of this Student Version manual walks you through a detailed demonstration of the basic operation of your EViews student version—taking you from importing data from an Excel spreadsheet, to running a regression and performing hypothesis tests. We also provide a discussion of basics of working with EViews workfiles and objects.

The EViews Manuals (PDF Files)

While a printed version of the full EViews documentation is not provided with the Student Version, your CD-ROM does include Adobe Portable Document Format (.PDF) files containing the entire *User's Guide*. A copy of Adobe Acrobat Reader is provided with the Student Version so that you may both read and print the documentation. A listing of the contents of each chapter of the

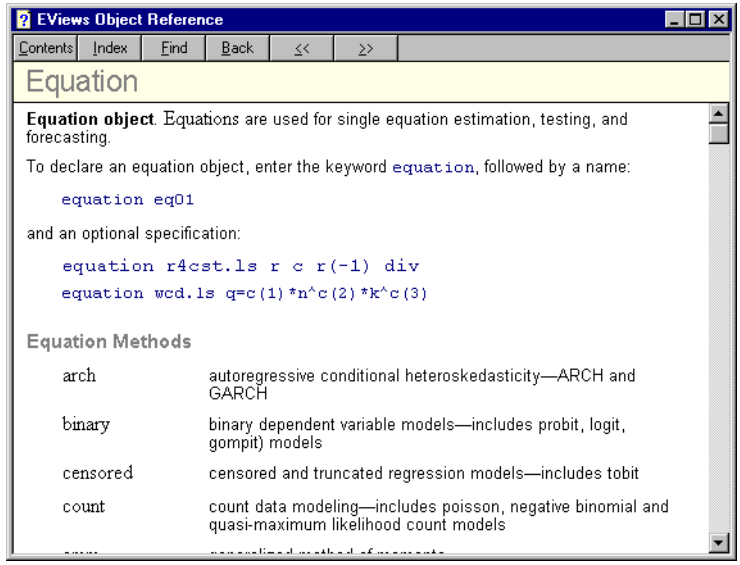
full *User's Guide* is provided at the end of the Student Version manual. The **Read Me First** document on your CD-ROM disc documents the use of the PDF files and Acrobat Reader.

The full version of the program also includes a second manual, the *Command and Programming Reference*, which provides systematic information about the details of EViews commands and the programming language. This manual is not provided with the Student Version, but the majority of the information in this manual is provided in the on-line Help System (described below).

The Help System

Almost all of the EViews documentation may be viewed from within EViews by using the help system. To access the EViews help system, simply go to the main menu and select **Help**.

Since EViews uses standard Windows Help, the on-line manual is fully searchable and hypertext linked. You can set bookmarks to frequently accessed pages, and annotate the on-line documentation with your own notes.



In addition, the Help system will contain updates to the documentation that were made after the manuals went to press.

The World Wide Web

To supplement the information provided in the manuals and the help system, we have set up information areas on the Web that you may access using your favorite browser. You can find answers to common questions about installing, using, and getting the most out of EViews.

So set a bookmark to our site and visit often; the address is: **http://www.eviews.com.**

Chapter 2. A Demonstration (Student Version)

In this chapter, we provide a demonstration of the basic features of EViews. The demonstration is not meant to be a comprehensive description of the program. A full description of the program begins in Chapter 3 of the PDF documentation on your CD-ROM.

This demo shows takes you through the following steps:

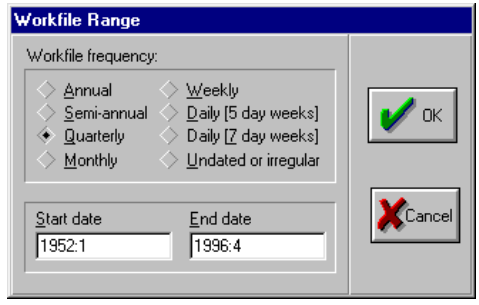
- importing data into EViews from an Excel spreadsheet
- examining the data and performing simple statistical analysis
- using regression analysis to model and forecast a statistical relationship
- performing specification and hypothesis testing
- plotting results

Creating a Workfile and Importing Data

The first step in the project is to read the data into an EViews workfile.

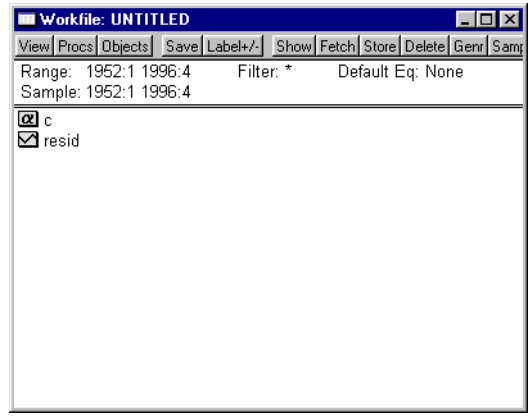
Before we describe the process of importing data, note that the demonstration data have been included in your EViews directory in both Excel spreadsheet and EViews workfile formats. If you wish to skip the discussion of importing data and go directly to the analysis part of the demonstration, you may load these data by selecting **File/Open/Workfile…** and opening DEMO.WF1.

To create a workfile to hold your data, select **File/New/Workfile…**, which opens a dialog box where you will provide information about your data:



For our example, quarterly data are observed from the first quarter of 1952 to the end of 1996. You should set the workfile frequency to quarterly, and specify the start date 1952:1, and the end date 1996:4.

Once you have filled out the dialog, click on the **OK** button. EViews will create an untitled workfile, and will display a workfile window.



The workfile window is described in detail in Chapter 3, beginning on page 33. For now, notice that the workfile window displays two pairs of dates: one for the range of dates contained in the workfile, and the second for the current workfile sample. Note also that the workfile contains the coefficient vector C and the series RESID. All EViews workfiles will contain these two objects.

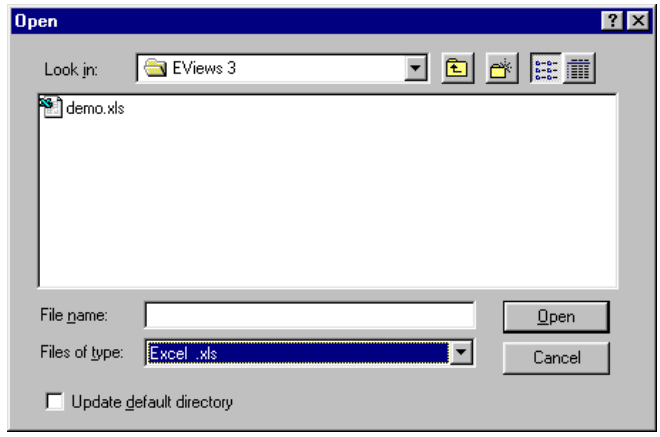
The next step is to import data into the workfile. The data for the four variables used in the analysis have been provided in an Excel file named DEMO.XLS. The data in the DEMO.XLS are arranged with each of the four series in columns, with names in the first row, and dates in the first column:

demo.xls

	A	B	C	D	E	F	G
1	OBS	GDP	PR	M1	RS		
2	1952:1	87.875	0.197561	126.537	1.64		
3	1952:2	88.125	0.198167	127.506	1.677667		
4	1952:3	89.625	0.200179	129.385	1.828667		
5	1952:4	92.875	0.201246	128.512	1.923667		
6	1953:1	94.625	0.201052	130.587	2.047333		
7	1953:2	95.55	0.201444	130.341	2.202667		
8	1953:3	95.425	0.202236	131.389	2.021667		
9	1953:4	94.175	0.202723	129.891	1.486333		
10	1954:1	94.075	0.203416	130.173	1.083667		
11	1954:2	94.2	0.203841	131.385	0.814333		
12	1954:3	95.45	0.204291	134.627	0.869667		
13	1954:4	97.36375	0.204374	134.252	1.036333		
14	1955:1	100.725	0.205603	136.413	1.256333		
15	1955:2	102.825	0.206227	136.471	1.614333		
16	1955:3	104.925	0.207762	138.377	1.861333		

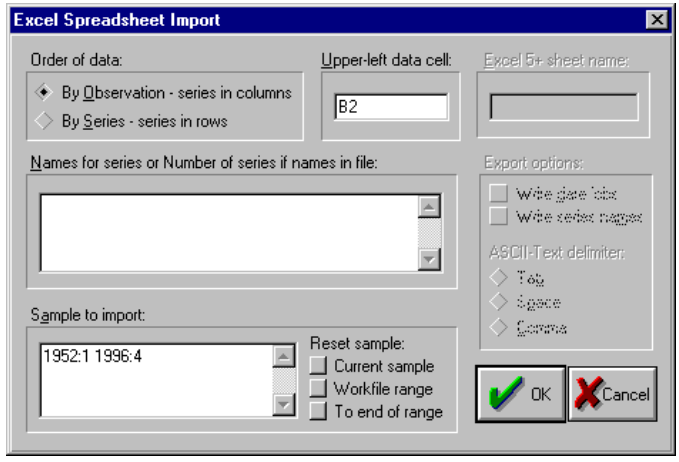
demo

To read these data, click on **Procs/Import/Read Text-Lotus-Excel…**, which opens the following file open dialog:

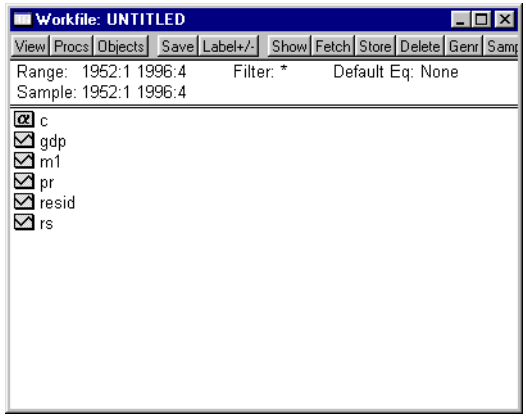


Locate the DEMO.XLS file (it should be in your EViews installation or "Example Files" directory) and double click on the file name. You can make finding the file a bit easier by choosing to display **Excel .xls** files from the **Files of type** combo box.

EViews will open the Excel spreadsheet import dialog:



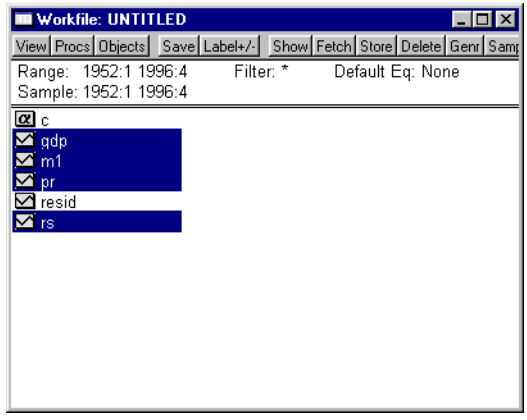
The default settings for order of data, upper-left data cell, and the sample to import should be appropriate for this Excel file. Since the names of the series are in the first row of the Excel file, you can simply enter the number of series (in this case you will want to enter “4”), in the **Names for series or Number of series if name in file** field of the dialog box. Click **OK**, and EViews will import the four series. These series will appear as icons in the workfile window:



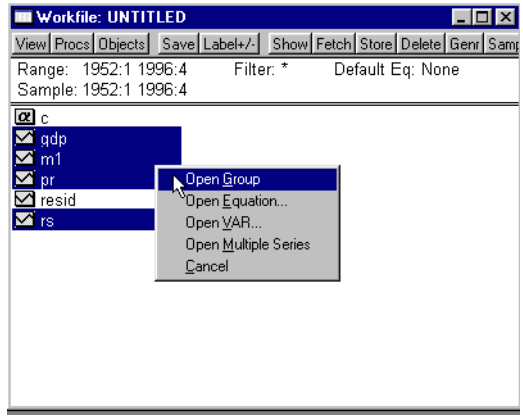
An alternative method of importing the data is to copy-and-paste the data from the Excel spreadsheet directly into EViews. This procedure is described in detail in Chapter 4, “Copying and Pasting” on page 66 of the Standard Version documentation.

Verifying the Data

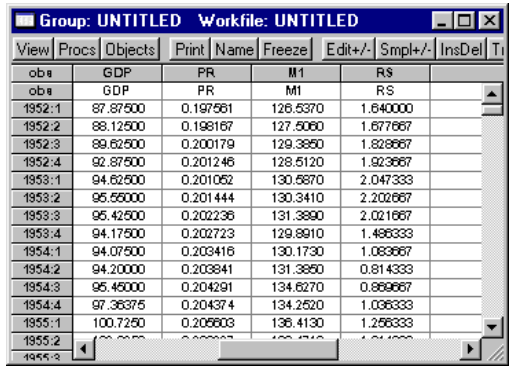
The first thing you should do after importing the data is to verify that the data have been read correctly. We will create a group object that allows us to examine all four series. Click on the name GDP in the workfile window, and then press CTRL and click on M1, PR, and RS. All four of the series should be highlighted:



Now place the cursor anywhere in the highlighted area and double click the left mouse button. EViews will open a popup menu providing you with several options:



Choose **Open Group**. EViews will create an untitled group object containing all four of the series. The default window for the group shows a spreadsheet view of the series:

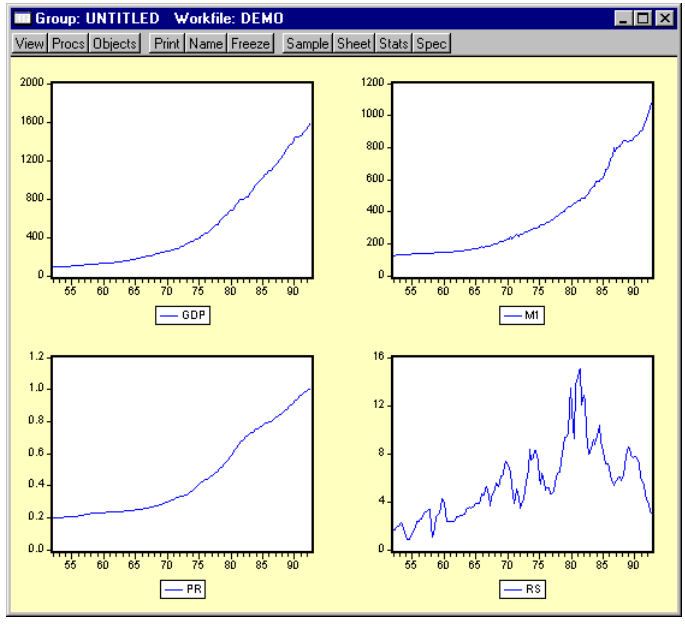


You should compare the spreadsheet view with the top of the Excel worksheet to ensure that the first part of the data has been read correctly. You can use the scroll bars and scroll arrows on the right side of the window to verify the remainder of the data.

Once you are satisfied that the data are correct, you should save the workfile by clicking the **Save** button in the workfile window. A save dialog will open, prompting you for a workfile name and location. You should enter DEMO2, then click OK. EViews will save the workfile in the specified directory with the name DEMO2.WF1. A saved workfile can be opened later by selecting **File/Open/Workfile…** from the main menu.

Examining the Data

We can use basic EViews tools to examine the data in your group object in a variety of ways. For example, if you select **View/Multiple Graphs/Line** from the group object toolbar, EViews displays line graphs of each of the series in the group:



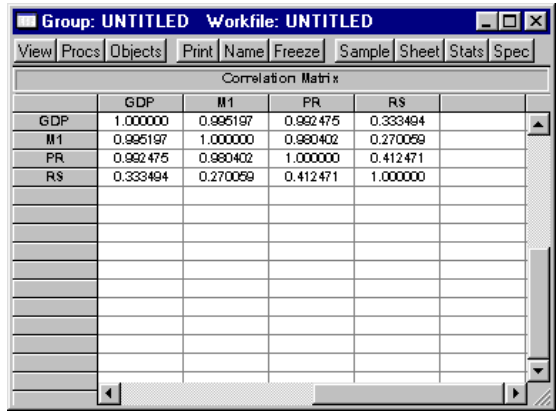
You can select **View/Descriptive Stats/Individual Samples** to compute descriptive statistics for each of the series in the group:

Group: UNTITLED Workfile: UNTITLED

View | Procs | Objects | Print | Name | Freeze | Sample | Sheet | Stats | Spec

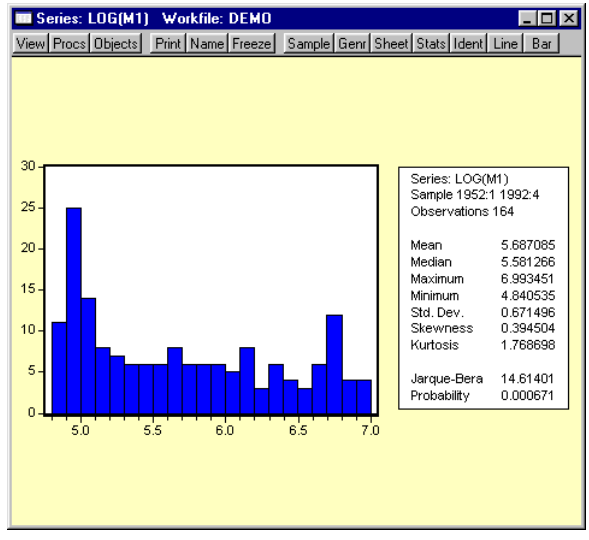
	GDP	M1	PR	RS
Mean	632.4190	445.0064	0.514106	5.412928
Median	374.3000	298.3990	0.383802	5.057500
Maximum	1948.225	1219.420	1.110511	15.08733
Minimum	87.87500	126.5370	0.197561	0.814333
Std. Dev.	564.2441	344.8315	0.303483	2.908939
Skewness	0.843527	0.995000	0.591063	0.984037
Kurtosis	2.331980	2.672168	1.819076	4.027384
Jarque-Bera	24.69301	30.50682	20.94002	36.96626
Probability	0.000004	0.000000	0.000028	0.000000
Observations	180	180	180	180

or click on **View/Correlations** to display the correlation matrix of the four series:

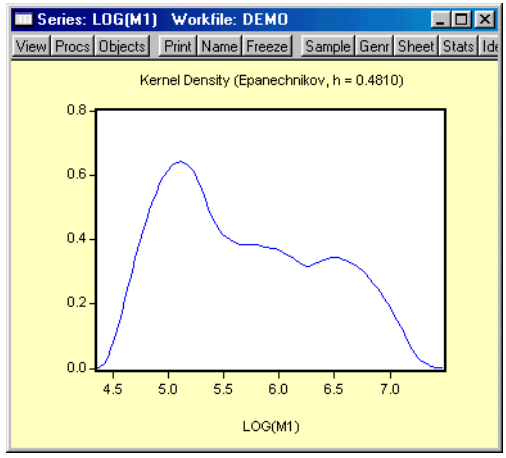


We can also examine characteristics of the individual series. Since our regression analysis below will be expressed in logarithms, we will work the log of M1. Select **Quick/Show…** then enter `log(m1)`, and click OK. EViews will open a series window for LOG(M1).

Now select **View/Descriptive Statistics/Histogram and Stats** from the series toolbar to display the descriptive statistics for LOG(M1):



We can construct a smoothed version of the histogram by selecting **View/Distribution Graphs/ Kernel Density…** and clicking on OK to accept the default options:



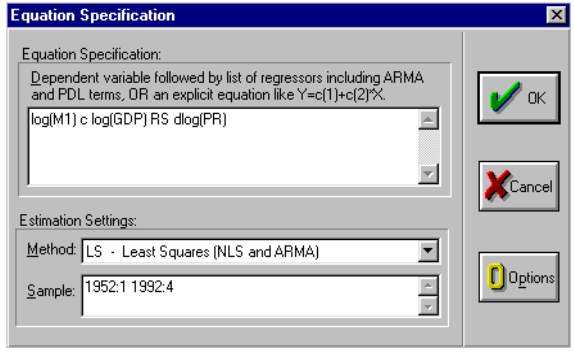
Estimating a Regression Model

We now estimate a regression model for M1 using data over the period from 1952:1–1992:4 and use this estimated regression to construct forecasts over the period 1993:1–2003:4. The model specification is

$$\log(M1_t) = \beta_1 + \beta_2 \log GDP_t + \beta_3 RS_t + \beta_4 \Delta \log PR_t + \epsilon_t \tag{2.1}$$

where log(M1) is the logarithm of the money supply, log(GDP) is the log of income, RS is the short term interest rate, and $\Delta \log(\text{PR})$ is the log first difference of the price level (the approximate rate of inflation).

To estimate the model, we will create an equation object. Select **Quick** from the main menu and choose **Estimate Equation…** to open the estimation dialog. Enter the following equation specification:



Here we list the name of the dependent variable, followed by the names of each of the regressors, separated by spaces. We use expressions involving the functions `log` and `dlog` to represent the log transformations of M1 and GDP, and the difference of the log transformation for PR. The built-in series name C stands for the constant in the regression.

The dialog is initially set to estimate the equation using the **LS - Least Squares** method for the **Sample** 1952:1 1996:4. You should change the **Sample** to 1952:1 1992:4 to estimate the equation for the subsample of observations.

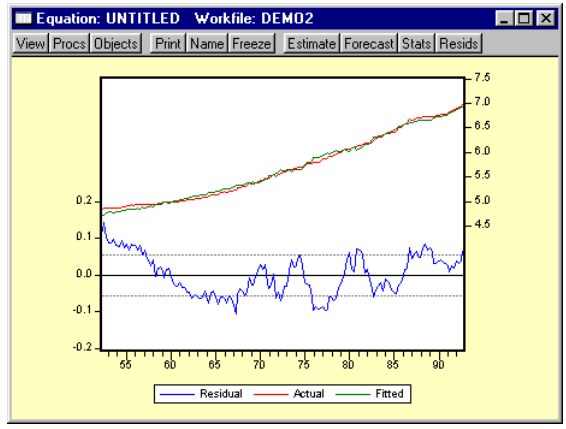
Click **OK** to estimate the equation using least squares and to display the regression results:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 10/19/97 Time: 22:43
Sample(adjusted): 1952:2 1992:4
Included observations: 163 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.312383	0.032199	40.75850	0.0000
LOG(GDP)	0.772035	0.006537	118.1092	0.0000
RS	-0.020686	0.002516	-8.221196	0.0000
DLOG(PR)	-2.572204	0.942556	-2.728967	0.0071

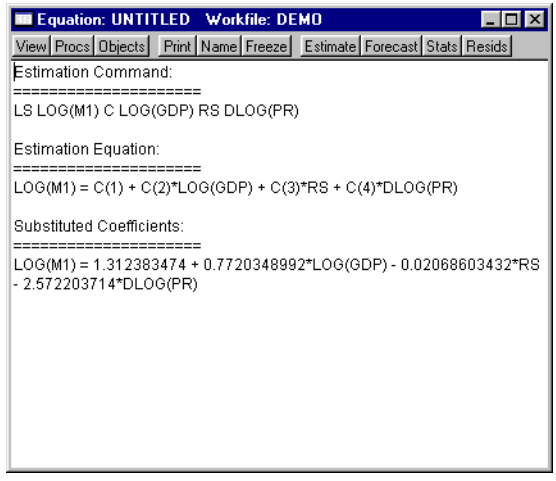
R-squared	0.993274	Mean dependent var	5.692279
Adjusted R-squared	0.993147	S.D. dependent var	0.670253
S.E. of regression	0.055485	Akaike info criterion	-2.921176
Sum squared resid	0.489494	Schwarz criterion	-2.845256
Log likelihood	242.0759	F-statistic	7826.904
Durbin-Watson stat	0.140967	Prob(F-statistic)	0.000000

Note that the equation is estimated from 1952:2 to 1992:4 since one observation is dropped from the beginning of the estimation sample to account for the `dlog` difference term. The estimated coefficients are statistically significant, with t-statistic values well in excess of 2. The overall regression fit, as measured by the R^2 value, indicates a very tight fit. You can select **View/ Actual, Fitted, Residual/Graph** in the equation toolbar to display a graph of the actual and fitted values for the dependent variable, along with the residuals:



Specification and Hypothesis Tests

We can use the estimated equation to perform hypothesis tests on the coefficients of the model. For example, to test the hypothesis that the coefficient on the price term is equal to 2, we will perform a Wald test. First, determine the coefficient of interest by selecting **View/Representations** from the equation toolbar:



Note that the coefficients are assigned in the order that the variables appear in the specification so that the coefficient for the PR term is labeled C(4). To test the restriction on C(4) you should select **View/Coefficient Tests/Wald–Coefficient Restrictions…**, and enter the restriction `c(4)=2`. EViews will report the results of the Wald test:

Wald Test:
Equation: Untitled

Null Hypothesis:	C(4)=2		
F-statistic	23.53081	Probability	0.000003
Chi-square	23.53081	Probability	0.000001

The low probability values indicate that the null hypothesis that $C(4) = 2$ is strongly rejected.

We should, however, be somewhat cautious of accepting this result without additional analysis. The low value of the Durbin-Watson statistic reported above is indicative of the presence of serial correlation in the residuals of the estimated equation. If uncorrected, serial correlation in the residuals will lead to incorrect estimates of the standard errors, and invalid statistical inference for the coefficients of the equation.

The Durbin-Watson statistic can be difficult to interpret. To perform a more general Breusch-Godfrey test for serial correlation in the residuals, select **View/Residual Tests/Serial Correlation LM Test…** from the equation toolbar, and specify an order of serial correlation to test against. Entering 1 yields a test against first-order serial correlation:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	813.0060	Probability	0.000000
Obs*R-squared	136.4770	Probability	0.000000

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/19/97 Time: 22:45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006355	0.013031	-0.487683	0.6265
LOG(GDP)	0.000997	0.002645	0.376929	0.7067
RS	-0.000567	0.001018	-0.556748	0.5785
DLOG(PR)	0.404143	0.381676	1.058864	0.2913
RESID(-1)	0.920306	0.032276	28.51326	0.0000

R-squared	0.837282	Mean dependent var	1.21E-15
Adjusted R-squared	0.833163	S.D. dependent var	0.054969
S.E. of regression	0.022452	Akaike info criterion	-4.724644
Sum squared resid	0.079649	Schwarz criterion	-4.629744
Log likelihood	390.0585	F-statistic	203.2515
Durbin-Watson stat	1.770965	Prob(F-statistic)	0.000000

The top part of the output presents the test statistics and associated probability values. The test regression used to carry out the test is reported below the statistics.

The statistic labeled "Obs*R-squared" is the LM test statistic for the null hypothesis of no serial correlation. The (effectively) zero probability value strongly indicates the presence of serial correlation in the residuals.

Modifying the Equation

The test results suggest that we need to modify our original specification to take account of the serial correlation.

One approach is to include lags of the independent variables. To add variables to the existing equation, click on the **Estimate** button in the equation toolbar and edit the specification to include lags for each of the original explanatory variables:

```
log(m1) c log(gdp) rs dlog(pr) log(m1(-1)) log(gdp(-1)) rs(-1)
   dlog(pr(-1))
```

Note that lags are specified by including a negative number, enclosed in parentheses, following the series name. Click on **OK** to estimate the new specification and to display the results:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 10/19/97 Time: 22:48
Sample(adjusted): 1952:3 1992:4
Included observations: 162 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.071297	0.028248	2.523949	0.0126
LOG(GDP)	0.320338	0.118186	2.710453	0.0075
RS	-0.005222	0.001469	-3.554801	0.0005
DLOG(PR)	0.038615	0.341619	0.113036	0.9101
LOG(M1(-1))	0.926640	0.020319	45.60375	0.0000
LOG(GDP(-1))	-0.257364	0.123264	-2.087910	0.0385
RS(-1)	0.002604	0.001574	1.654429	0.1001
DLOG(PR(-1))	-0.071650	0.347403	-0.206246	0.8369

R-squared	0.999604	Mean dependent var	5.697490
Adjusted R-squared	0.999586	S.D. dependent var	0.669011
S.E. of regression	0.013611	Akaike info criterion	-5.707729
Sum squared resid	0.028531	Schwarz criterion	-5.555255
Log likelihood	470.3261	F-statistic	55543.30
Durbin-Watson stat	2.393764	Prob(F-statistic)	0.000000

Note that EViews has automatically adjusted the estimation sample to accommodate the additional lagged variables. We will save this equation in the workfile for later use. Press the **Name** button in the toolbar and name the equation EQLAGS.

Another common method of accounting for serial correlation is to include autoregressive (AR) and/or moving average (MA) terms in the equation. To estimate the model with an AR(1) error specification, you should make a copy of the previous equation by clicking **Objects/Copy Object…** EViews will create a new untitled equation containing all of the information from the

previous equation. Press **Estimate** on the toolbar of the copy and modify the specification to read

```
log(m1) c log(gdp) rs dlog(pr) ar(1)
```

This specification removes the lagged terms, replacing them with an AR(1) specification. Click **OK**. EViews will report the estimation results, including the estimated first-order autoregressive coefficient of the error term:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 10/19/97 Time: 22:52
Sample(adjusted): 1952:3 1992:4
Included observations: 162 after adjusting endpoints
Convergence achieved after 14 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.050340	0.328390	3.198453	0.0017
LOG(GDP)	0.794929	0.049342	16.11057	0.0000
RS	-0.007395	0.001457	-5.075131	0.0000
DLOG(PR)	-0.008019	0.348689	-0.022998	0.9817
AR(1)	0.968100	0.018190	53.22283	0.0000

R-squared	0.999526	Mean dependent var	5.697490
Adjusted R-squared	0.999514	S.D. dependent var	0.669011
S.E. of regression	0.014751	Akaike info criterion	-5.564584
Sum squared resid	0.034164	Schwarz criterion	-5.469288
Log likelihood	455.7313	F-statistic	82748.93
Durbin-Watson stat	2.164265	Prob(F-statistic)	0.000000

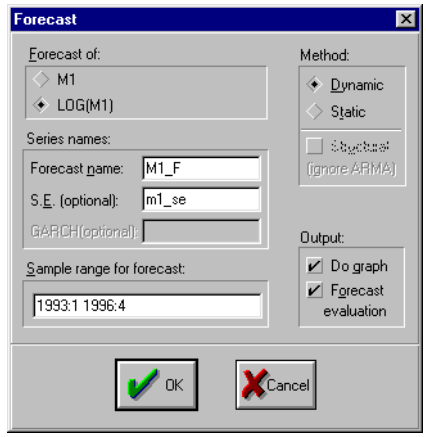
Inverted AR Roots	.97

The fit of the AR(1) model is roughly comparable to the lag model, but the somewhat higher values for both the Akaike and the Schwarz information criteria indicate that the previous lag model should be preferred. We will work with the lag model for the remainder of the demonstration.

Forecasting from an Estimated Equation

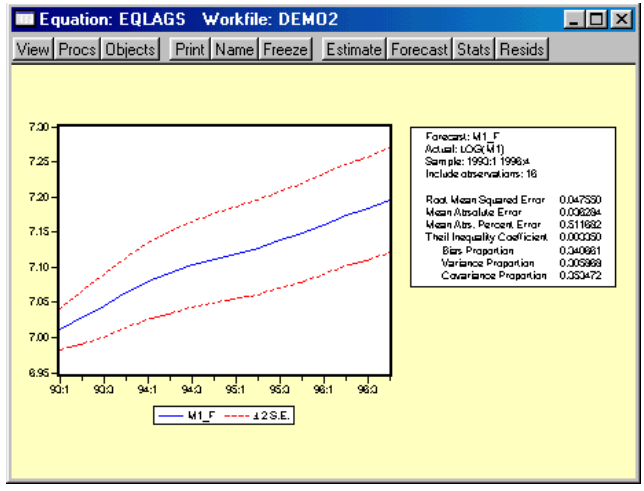
We have estimated the equations for a subset of our data, so that we may compare forecasts based upon this model with the actual data for the post-estimation sample 1993:1–1996:4.

Click on the **Forecast** button in the EQLAGS equation toolbar to open the forecast dialog:

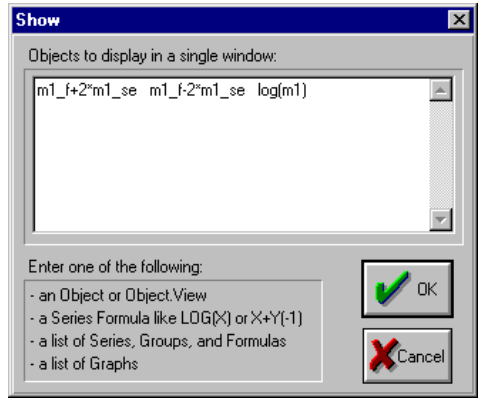


We set the forecast sample to 1993:1–1996:4 and provide names for both the forecasts and forecast standard errors so both will be saved as series in the workfile. The forecasted values will be saved in M1_F and the forecast standard errors will be saved in M1_SE.

Note also that we have elected to forecast the log of M1, not the level, and that we request both graphical and forecast evaluation output. The **Dynamic** option constructs the forecast for the sample period using only information available at the beginning of 1993:1. When you click **OK**, EViews displays both a graph of the forecasts, and statistics evaluating the quality of the fit to the actual data:

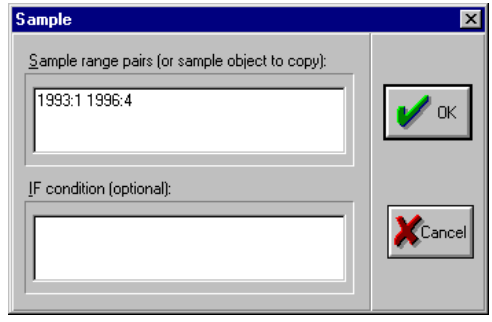


We can also plot the actual values of log(M1) against the forecasted values and the (approximate) 95% confidence intervals for the forecasts. First, we will create a new group containing these values by **Quick/Show…** and filling out the dialog as follows:

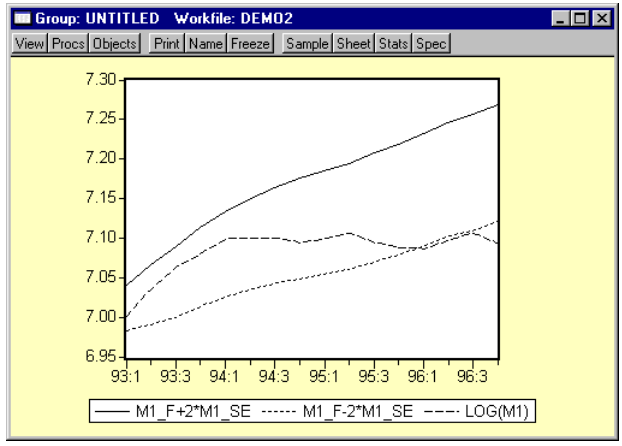


There are three expressions in the dialog. The first two represent the upper and lower bounds of the (approximate) 95% forecast interval as computed by evaluating the values of the point forecasts plus and minus two times the standard errors. The last expression represents the actual values of the dependent variable.

When you click **OK**, EViews opens an untitled group window containing a spreadsheet view of the data. Before plotting the data, we will change the sample of observations so that we only plot data for the forecast sample. Select **Quick/Sample…** or click on the **Sample** button in the group toolbar, and change the sample to include only the forecast period:

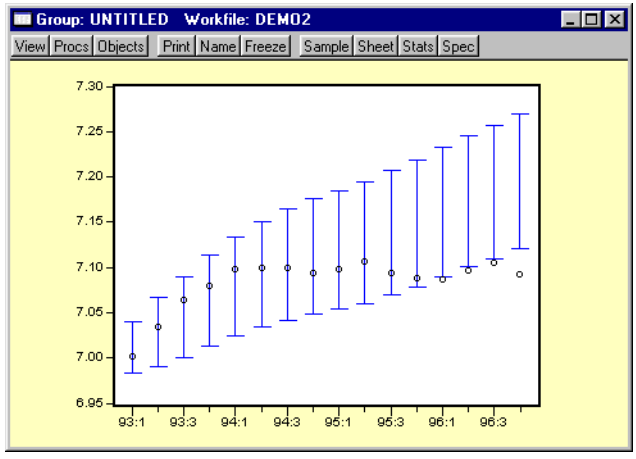


To plot the data for the forecast period, select **View/Graph/Line** from the group window:



The actual values of log(M1) are within the forecast interval for most of the forecast period, but fall below the lower bound of the 95% confidence interval beginning in 1996:1.

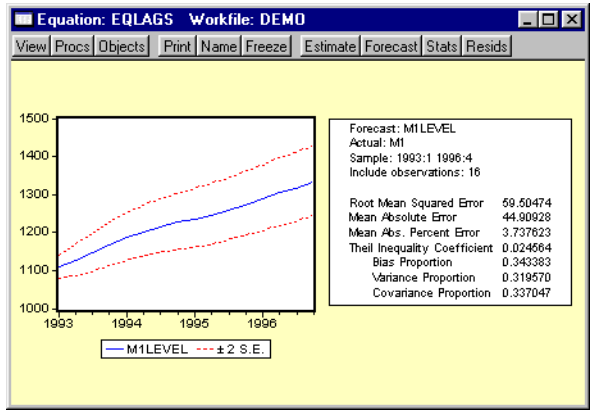
For an alternate view of these data, you can select **View/Graph/High-Low(-Close)**, which displays the graph as follows:



This high-low chart clearly shows that the forecasts of log(M1) over-predict the actual values in the last four quarters of the forecast period.

We may also choose to examine forecasts of the level of M1. Click on the **Forecast** button in the EQLAGS equation toolbar to open the forecast dialog, and select M1 under the **Forecast of** option. Enter a new name to hold the forecasts, say M1LEVEL, and click **OK**. EViews will present

a graph of the forecast of the level of M1, along with the asymmetric confidence intervals for this forecast:



Additional Issues

It is worth noting that the example analysis above should be used for illustrative purposes only since there are a number of problems with the specification.

For one, there is quite a bit of serial correlation remaining in the EQLAGS specification. A test of serial correlation in the new equation (by selecting **View/Residual Tests/Serial Correlation LM Test…**, and entering 1 for the number of lags) rejects the null hypothesis of no serial correlation in the reformulated equation:

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	7.880369	Probability	0.005648
Obs*R-squared	7.935212	Probability	0.004848

Furthermore, there is evidence of autoregressive conditional heteroskedasticity (ARCH) in the residuals. Select **View/Residual Tests/ARCH LM Test…** and accept the default of 1. The ARCH test results strongly suggest the presence of ARCH in the residuals:

ARCH Test:			
F-statistic	11.21965	Probability	0.001011
Obs*R-squared	10.61196	Probability	0.001124

In addition to serial correlation and ARCH, there is an even more fundamental problem with the above specification since, as the graphs attest, log(M1) exhibits a pronounced upward trend. We

can, and should, perform tests for a unit root in this series. The presence of a unit root will indicate the need for further analysis.

Display the series window by clicking on **Window** and selecting the LOG(M1) series window from the menu. If the series window is closed, you may open a new window by selecting **Quick/Show…**, entering `log(m1)`, and clicking OK.

To perform an Augmented Dickey-Fuller (ADF) test for nonstationarity of this series, select **View/Unit Root Test…** and click on OK to accept the default options. EViews will perform an ADF test and display the test results:

ADF Test Statistic	0.665471	1% Critical Value*	-3.4688
		5% Critical Value	-2.8780
		10% Critical Value	-2.5755

*MacKinnon critical values for rejection of hypothesis of a unit root.

The ADF test statistic value is greater than the critical values so that we cannot reject the null hypothesis of a unit root. The presence of a unit root suggests that we need to adopt more sophisticated statistical models. These techniques are discussed in Chapters 13 and 20 of the Standard Version *User's Guide* (provided in PDF format on your CD-ROM) which deal with time series and vector autoregression and vector error correction specifications.

Chapter 3. EViews Basics (Student Version)

Managing the variety of tasks associated with your work can be a complex and time-consuming process. Fortunately, EViews' innovative design takes much of the effort out of organizing your work, allowing you to concentrate on the substance of your project.

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.

The remainder of this chapter describes basic techniques for working with objects and workfiles. While you may at first find the idea of objects to be a bit foreign, the basic concepts are easy to master and will form the foundation for your work in EViews. But don't feel that you have to understand all of the concepts the first time through. If you wish, you can begin working with EViews immediately, developing an intuitive understanding of objects and workfiles as you go.

Workfile Basics

All EViews objects must be held in an object container. Most of your work in EViews will involve objects that are contained in a workfile, so your first step in any project will be to create a new workfile or to load an existing workfile into memory.

Workfiles have two primary characteristics. First, they are held in RAM for quick access to the objects in the workfile. Second, workfiles are characterized by a frequency and a range.

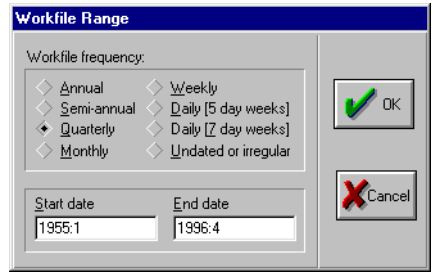
Data are often sampled at equally spaced intervals, or frequencies, over calendar time. When you set a workfile frequency, you tell EViews about the intervals between observations in your data. EViews has dated workfile types which handle annual, semi-annual, quarterly, monthly, weekly, and daily (5- or 7-day) data. For these workfiles, EViews will use all available calendar information in organizing and managing your data. For example, for weekly and daily data, EViews knows that some years contain days in each of 53 weeks, and that some years have 366 days, and will adjust the number of observations in a year accordingly.

Undated or irregular workfiles are those in which no dates are associated with the data—observations are simply numbered consecutively. Undated data are typically used for cross-section data, but may also be used in any situation where data are sampled irregularly; for example, financial data with frequent and irregular breaks for non-trading days.

The workfile range is a pair of dates or observation numbers describing the first and last observation to be held in the workfile.

Creating a Workfile

Your first step in EViews will usually be to create a workfile. One way to create a workfile is to click **File/New/Workfile…** and then to provide the necessary dialog information.



Select the appropriate frequency and enter the information for the workfile range. The **Start date** is the earliest date or observation you plan to use in the project and the **End date** is the latest date or observation. Don't worry if you don't know the exact start and end date; if you later find that your workfile isn't the right size, you can expand or contract the workfile range.

The rules for describing dates are quite simple:

Annual: specify the year. Years before and after the 20th century must be identified with full-year identifiers (e.g. 1776, 2020, 9789 or 50234). Years in the 20th century may be identified using either 2 or 4-digit identifiers (e.g. 97 or 1997). Note that because 2-digit identifiers are assumed to be in the 20th century, EViews cannot handle dates prior to A.D. 100.

Quarterly: the year, followed by a colon or the letter "Q", and then the quarter number. Examples: 1992:1, 65:4, 2002Q3.

Monthly: the year, followed by a colon or the letter "M", and then the month number. Examples: 1956:1, 1990M1.

Semi-Annual: the year, followed by a colon or the letter "S", and then either "1" or "2" to denote the period. Examples: 1992:1, 2024S2.

Weekly and daily: by default, you should specify these dates as month number, followed by a colon, followed by the day number, followed by a colon, followed by the year. Using the **Options/Dates-Frequency…** menu item, you can reverse the order of the day and month by switching to European notation.

For example, entering `8:10:97` indicates that you want your workfile to begin with August 10, 1997. If you have previously set your default date-frequency option to European notation, this date represents October 8, 1997.

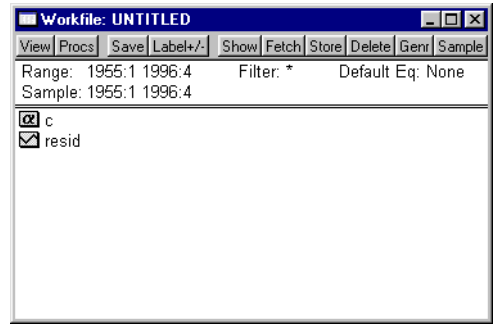
With weekly data, the day of the week associated with the starting date determines the

beginning of the week. In the examples above, the first observations would be the week running from Sunday, August 10 through Saturday, August 16, 1997, or the week running from Wednesday, October 8, through Tuesday, October 14, 1997.

Alternatively, for quarterly, monthly, weekly, and daily data, you can enter just the year, and EViews will automatically specify the first and last observations for you.

In Appendix C of the Standard Version documentation, "Date Formats", we discuss the specification of dates in EViews in greater detail.

After you have finished supplying the information about the type of workfile and clicked **OK**, you will see the workfile window:



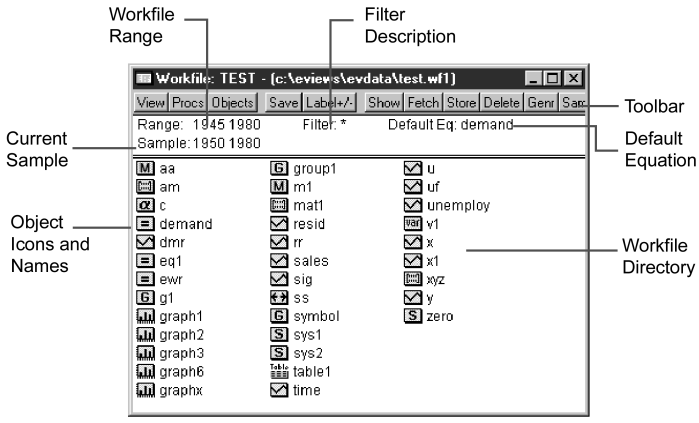
Here we have specified a workfile which will contain quarterly data from the first quarter of 1955 through the end of 1996. Since we have not yet saved the workfile, it is UNTITLED.

Note that there are two icons in this newly created workfile. These icons represent the objects that are contained in *every* workfile: a vector of coefficients, C, and a series of residuals, RESID. The little icon to the left identifies the type of object, an α for a coefficient vector and a tiny time series plot for a series.

Workfiles may also be created directly from EViews databases. See Chapter 6 of the Standard Version documentation for further details.

The Workfile Window

After you have created a workfile and a number of objects, the workfile window will look something like this:



In the titlebar of the workfile window you will see the "**Workfile**" designation followed by the workfile name. If the workfile has not been saved, it will be designated "UNTITLED". If the workfile has been saved to disk, you will see the name and the full disk path.

Just below the titlebar is a toolbar made up of a number of buttons. These buttons provide you with easy access to a number of useful workfile operations.

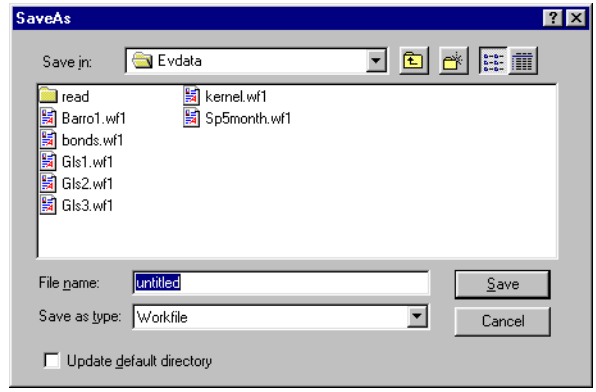
Below the toolbar are two lines of status information where EViews displays the range of the workfile, the current *sample* of the workfile (the range of observations that are to be used in calculations and statistical operations), the display filter (rule used in choosing a subset of objects to display in the workfile window), and the *default equation* (the last equation estimated or operated on). You may change the range, sample, and filter by double clicking on these labels and entering the relevant information in the dialog boxes. Double clicking on the equation label opens the equation.

Lastly, you will see the workfile directory. In normal display mode, all named objects are listed in the directory by name and icon. The different types of objects and their icons are described in detail in "Object Types" on page 38.

It is worth remembering that the workfile window is a specific example of an object window. Object windows are discussed in "The Object Window" on page 41.

Saving Workfiles

You will want to name and save your workfile for future use. Push the **Save** button on the workfile toolbar to save a copy of the workfile on disk. You can also save the file using the **File/SaveAs…** or **File/Save…** choices from the main menu. A standard Windows file dialog box will open:



You can specify the target directory in the upper file menu labeled **Save in:.** You can navigate between directories in the standard Windows fashion—click once on the down arrow to access a directory tree; double clicking on a directory name in the display area gives you a list of all the files and subdirectories in that directory. Once you have worked your way to the right directory, type the name you want to give the workfile in the **File name:** box and push the **Save** button. Your workfile will be saved with the name you choose and the extension .WF1.

Alternatively, you could just type the full Windows path information and name, in the **File name:** box.

Once the workfile is named and saved, you can save subsequent updates or changes using the **Save** button on the toolbar, or **File/Save…** from the main menu. Selecting **Save** will update the existing workfile stored on disk. As with other Windows software, **File/Save As…** can be used to save the file with a new name. If the file you save to already exists, EViews will ask you whether you want to update the version on disk.

Note that workfiles saved in version 3 can, in general, be read by previous versions of EViews. Objects that are new to version 3 will, however, be removed from the workfile. We recommend that you take great caution when saving over your workfile using older versions of EViews.

Loading Workfiles

You can use **File/Open/Workfile…** to bring back a previously saved workfile. You will typically save your workfile containing all of your data and results at the end of the day, and later use **File/Open/Workfile…** to pick up where you left off.

When you select **File/Open/Workfile…** you will see a standard Windows file dialog. Simply navigate to the appropriate directory and double click on the name of the workfile to load it into RAM. The workfile window will open and all of the objects in the workfile will immediately be available.

For convenience, EViews keeps a record of the ten most recently used workfiles and programs at the bottom of the **File** menu. Select an entry and it will be opened in EViews.

Version 3 of EViews can read workfiles from all previous versions of EViews.

Save and Load Options

There are optional settings in the **File/Open…** and **File/Save As…** dialogs which provide you with additional control over the procedures which use files saved on disk.

Set Default Directory

All EViews file dialogs begin with a display of the contents of the *default directory*. You can always identify the default directory from the listing on the EViews status line. The default directory is set initially to be the directory containing the EViews program, but it can be changed at any time.

You can change the default directory by using the **File/Open…** or the **File/SaveAs…** menu items, navigating to the new directory, and checking the **Update Default Directory** box in the dialog. If you then open or save a workfile, the default directory will change to the one you have selected.

An alternative method for changing the default EViews directory is to use the `cd` command. Simply enter "`cd`" followed by the directory name in the command window.

Resizing Workfiles

You may decide to add data or make forecasts for observations beyond the ending date or before the starting date of your workfile. Alternatively, you may wish to remove extra observations from the start or end of the workfile.

To change the size of your workfile, select **Procs/Change Workfile Range…** and enter the beginning and ending observation of the workfile in the dialog. If you enter dates that encompass the original workfile range, EViews will expand the workfile without additional comment. If you enter a workfile range that does not encompass the original workfile range, EViews will warn you that data will be lost, and ask you to confirm the operation.

Object Basics

Information in EViews is stored in *objects*. Each object consists of a collection of information related to a particular area of analysis. For example, a *series object* is a collection of information related to a set of observations on a particular variable. An *equation object* is a collection of information related to the relationship between a collection of variables.

Note that an object need not contain only one type of information. For example, an estimated equation object contains not only the coefficients obtained from estimation of the equation, but also a description of the specification, the variance-covariance matrix of the coefficient estimates, and a variety of statistics associated with the estimates.

Associated with each type of object is a set of views and procedures which can be used with the information contained in the object. This association of views and procedures with the type of data contained in the object is what we term the *object oriented* design of EViews.

The object oriented design simplifies your work in EViews by organizing information as you work. For example, since an equation object contains all of the information relevant to an estimated relationship, you can move freely between a variety of equation specifications simply by working with different equation objects. You can examine results, perform hypothesis and specification tests, or generate forecasts at any time. Managing your work is simplified since only a single object is used to work with an entire collection of data and results.

This brief discussion provides only the barest introduction to the use of objects. The remainder of this section will provide a more general description of EViews objects.

Object Data

Each object contains various types of information. For example, series, matrix, vector, and scalar objects, all contain mostly numeric information. In contrast, equations and systems contain complete information about the specification of the equation or system, and the estimation results, as well as references to the underlying data used to construct the estimates. Graphs and tables contain numeric, text, and formatting information.

Since objects contain various kinds of data, you will want to work with different objects in different ways. For example, you might wish to compute summary statistics for the observations in a series, or you may want to perform forecasts based upon the results of an equation. EViews understands these differences and provides you with custom tools, called views and procedures, for working with an object's data.

Object Views

There is more than one way to examine the data in an object. Views are tabular and graphical windows that provide various ways of looking at the data in an object.

For example, a series object has a spreadsheet view, which shows the raw data, a line graph view, a bar graph view, a histogram-and-statistics view, and a correlogram view. Other views of a series include distributional plots, QQ-plots, and kernel density plots. Series views also allow you to compute simple hypothesis tests and statistics for various subgroups of your sample.

An equation object has a representation view showing the equation specification, an output view containing estimation results, an actual-fitted-residual view containing plots of fitted values and residuals, a covariance view containing the estimated coefficient covariance matrix, and various views for specification and parameter tests.

Views of an object are displayed in the object's window. Only one window can be opened for each object and each window displays only a single view of the object at a time. You can change

views of an object using the View menu located in the object window's toolbar or the EViews main menu. We will describe this process in greater detail below.

Perhaps the most important thing to remember about views is that views normally do n't change data outside the object. Indeed, in most cases, changing views only changes the display format for the data, and not the data in the object itself.

Object Procedures

Most EViews objects also have *procedures*, or *procs*. Like views, procedures often display tables or graphs in the object's window. Unlike views, however, procedures alter data, either in the object itself or in another object.

Many procedures create new objects. For example, a series object contains procedures for smoothing or seasonally adjusting time series data and creating a new series containing the smoothed or adjusted data. Equation objects contain procedures for generating new series containing the residuals, fitted values, or forecasts from the estimated equation.

You select procedures from the **Procs** menu on the object's toolbar or from the EViews main menu.

Object Types

The most common objects in EViews are series and equation objects. There are, however, a number of different types of objects, each of which serves a unique function. Most objects are represented by a unique icon which is displayed in the object container window:


Coefficient Vector


Equation


Graph


Group


LogL


Matrix


Model


Pool (Time Series / Cross-Section)


Sample


Scalar


Series


State Space


System


SYM (Symmetric Matrix)


Table


Text


VAR (Vector Autoregression)

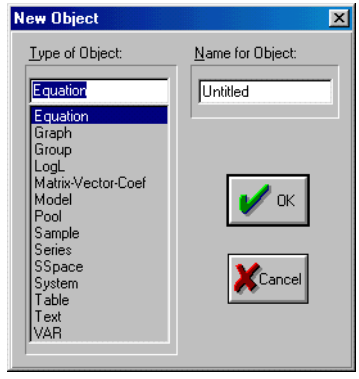

Vector/Row Vector

Despite the fact that they are also objects, object containers do not have icons since they cannot be placed in other object containers—thus, workfiles and databases do not have icons since they cannot be placed in other workfiles or databases.

Creating, Selecting, and Opening Objects

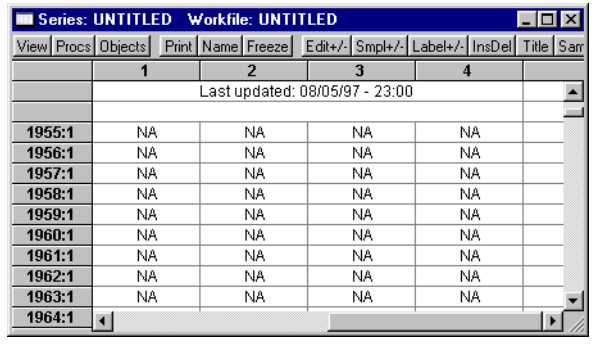
Creating Objects

To create an object, you must first make certain that you have an open workfile container and that the workfile window is active. Next, select **Objects/New Object…** from the main menu. Until you have created or loaded a workfile, this selection is unavailable. After you click on the menu entry, you will see the following dialog box:



You can click on the type of object you want, optionally provide a name and then click on **OK**. For some object types, another dialog box will open prompting you to describe your object in more detail. For most objects, however, the object window will open immediately.

For example, if you select **Equation**, you will see a dialog box prompting you for additional information. Alternatively, if you click on **Series** and then select **OK**, you will see an object window (series window) displaying the spreadsheet view of an UNTITLED series:



We will discuss object windows in greater detail below.

Objects can also be created by applying procedures to other objects or by freezing an object view (see “Freezing Objects” on page 46, below).

Selecting Objects

Creating a new object will not always be necessary. Instead, you may want to work with an existing object. One of the fundamental operations in EViews is *selecting* one or more objects from the workfile directory.

The easiest way to select objects is to point-and-click, using the standard Windows conventions for selecting contiguous or multiple items if necessary (see Chapter 1, "Selecting and Opening Items" on page 7). Keep in mind that if you are selecting a large number of items, you may find it useful to use the display filter before beginning to select items.

In addition, the **View** button in the workfile toolbar provides convenient selection shortcuts:

- **Select All** selects all of the objects in the workfile with the exception of the C coefficient vector and the RESID series.
- **Deselect All** eliminates any existing selections.

Opening Objects

Once you have selected your object or objects, you will want to open your selection, or create a new object containing the selected objects. You can do so by double clicking anywhere in the highlighted area.

If you double click on a single selected object, you open an object window.

If you select multiple graphs or series and double click, a pop-up menu appears giving you the option of creating and opening new objects (group, equation, VAR, graph) or displaying each of the selected objects in its own window.

Note that if you select multiple graphs and double click or select **View/Open as One Window**, all of the graphs are merged into a single graph that is displayed in a window.

Other multiple item selections are not valid, and will either issue an error or will simply not respond when you double click.

When you open an object, EViews will display the current view. In general, the current view of an object is the view that was displayed the last time the object was opened (if an object has never been opened, EViews will use a default view). The exception to this general rule is for those views that require significant computational time. In this latter case, the current view will revert to the default.

Showing Objects

An alternative method of selecting and opening objects is to "show" the item. Click on the **Show** button on the toolbar, or select **Quick/Show…** from the menu and type in the object name or names.

Show works exactly as if you first selected the object or objects, and then opened your selection. If you enter a single object name in the dialog box, EViews will open the object as if you double clicked on the object name. If you enter multiple names, EViews will always open a single window to display results, creating a new object if necessary.

Show can also be used to display functions of series, also known as auto-series. All of the rules for auto-series outlined in Chapter 5 of the Standard Version documentation, "Working with Auto-series" on page 94, will apply.

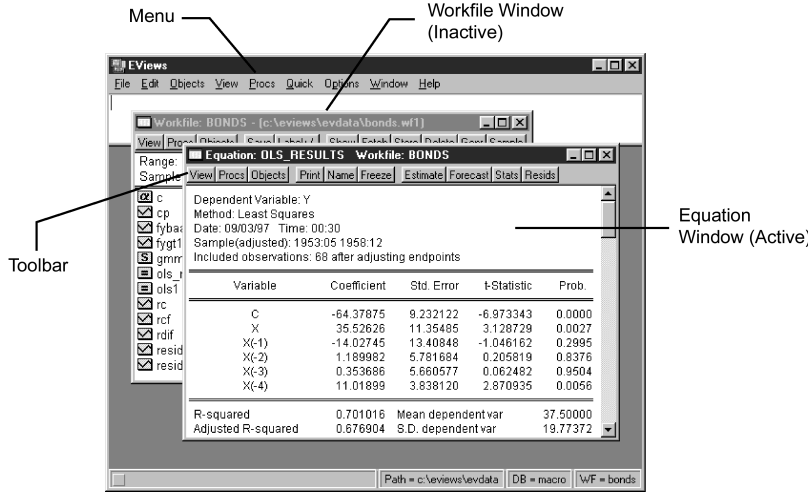
The Object Window

We have been using the term object window somewhat loosely in the previous discussion of the process of creating and opening objects. Object windows are the windows that are displayed when you open an object or object container. An object's window will contain either a view of the object, or the results of an object procedure.

One of the more important features of EViews is that you can display object windows for a number of items at the same time. Managing these object windows is similar to the task of managing pieces of paper on your desk.

Components of the Object Window

Let's look again at a typical object window:



Here, we see the equation window for OLS_RESULTS. First, notice that this is a standard window which can be closed, resized, minimized, maximized, and scrolled both vertically and horizontally. As in other Windows applications, you can make an object window active by clicking once

on the title bar, or anywhere in its window. Making an object window active is equivalent to saying that you want to work with that object.

Second, note that the title bar of the object window identifies the object type, name, and object container (in this case, the BONDS workfile). If the object is itself an object container, the container information is replaced by directory information.

Lastly, at the top of the window there is a toolbar containing a number of buttons that provide easy access to frequently used menu items. These toolbars will vary across objects—the series object will have a different toolbar from an equation or a group or a VAR object.

There are, however, several buttons that are found on all object toolbars:

- The **View** button lets you change the view that is displayed in the object window. The available choices will differ, depending upon the object type.
- The **Procs** button provides access to a menu of procedures that are available for the object.
- The **Objects** button lets you manage your objects. You can store the object on disk, name, delete, copy, or print the object.
- The **Print** button lets you print the current view of the object (the window contents).
- The **Name** button allows you to name or rename the object.
- The **Freeze** button creates a new object graph, table, or text object out of the current view.

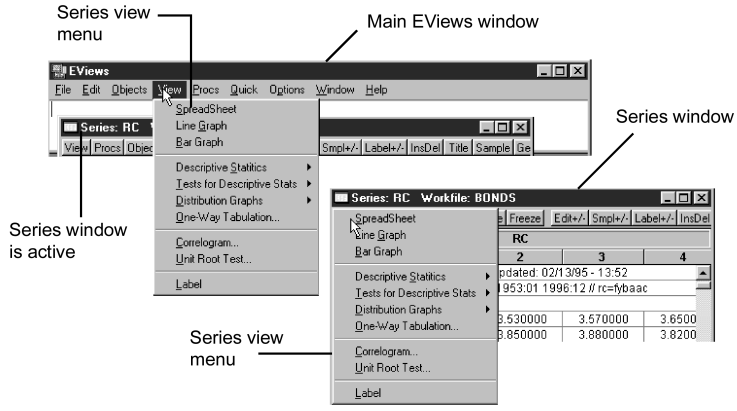
The other buttons on the series toolbar are specific to a series object and are described in Chapter 7 of the Standard Version documentation.

Menus and the Object Toolbar

As we have seen, the toolbar provides a shortcut to frequently accessed menu commands. There are a couple of subtle, but important, points associated with this relationship that deserve special emphasis:

- Since the toolbar simply provides a shortcut to menu items, you can always find the toolbar commands in the menus.
- This fact turns out to be quite useful if your window is not large enough to display all of the buttons on the toolbar. You can either enlarge the window so that all of the buttons are displayed, or you can access the command directly from the menu.
- The toolbar and menu *both* change with the object type. In particular, the View, and Procs menu contents will always change to reflect the type of object (series, equation, group, etc.) that is active.

The toolbars and menus themselves vary in how much they differ across objects. For example, the View and Procs drop-down menus differ for every object type. When the active window is a series, the menus provide access to series views and series procedures. Alternatively, when the active window is a group, clicking on **View** or **Procs** provides access to the different set of items associated with group objects.



The figure above illustrates the relationship between the View toolbar button and the View menu when the series is the active window. In the left side of the illustration, we see a portion of the *EViews window,* as it appears, after you click on View in the main menu (note that the RC series window is the active window). On the right, we see a depiction of the *series window* as it appears after you click on the **View** button in the series toolbar. Since the two operations are identical, the two drop-down menus are identical.

In contrast to the View and Procs Menus, the Objects menu does not, in general, vary across objects. An exception occurs, however, when an object container window (a workfile or database window) is active. In this case, clicking on **Objects** in the toolbar, or selecting **Objects** from the menu provides access to menu items for manipulating the objects in the container.

Working with Objects

Naming Objects

Objects may be named or unnamed. When you give an object a name, the name will appear in the directory of the workfile, and the object will be saved as part of the workfile when the workfile is saved.

You must name an object if you wish to keep its results. If you do not name an object, it will be called "UNTITLED". Unnamed objects are not saved with the workfile, so they are deleted when the workfile is closed and removed from memory.

To name or rename an object, first open the object window by double-clicking on its icon, or by clicking on **Show** on the workfile toolbar, and entering the object name. Next, click on the **Name** button on the object window, and enter the name (up to 16 characters), and optionally, a display name to be used when labelling the object in tables and graphs. If no display name is provided, EViews will use the object name.

You can also rename an object from the workfile window by selecting **Objects/Rename Selected…** and then specifying the new object name. This method saves you from first having to open the object.

The following names are reserved and should not be used as object names: ABS, ACOS, AR, ASIN, C, CON, CNORM, COEF, COS, D, DLOG, DNORM, ELSE, ENDIF, EXP, LOG, LOGIT, LPT1, LPT2, MA, NA, NRND, PDL, RESID, RND, SAR, SIN, SMA, SQR, and THEN.

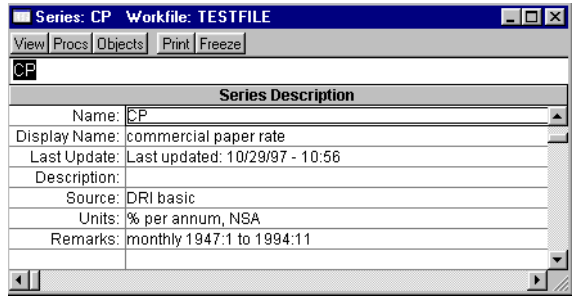
EViews accepts both capital and lower case letters in the names you give to your series and other objects, but does not distinguish between names based on case. Its messages to you will follow normal capitalization rules. For example, 'SALES', 'sales', and 'sAles' are all the same object in EViews. For the sake of uniformity, we have written all examples of input using names in lower case, but you should feel free to use capital letters instead.

Despite the fact that names are not case sensitive, when you enter text information in an object, such as a plot legend, or label information, your capitalization will be fully preserved.

By default, EViews allows only one untitled object of a given type (one series, one equation, etc.). If you create a new untitled object of an existing type, you will be prompted to name the original object, and if you do not provide one, EViews will replace the original untitled object with the new object. The original object will not be saved. If you prefer, you can instruct EViews to retain all untitled objects during a session (see Appendix B, "Window and Font Options" on page 581) but you must still name the ones you want to save with the workfile.

Labeling Objects

In addition to the display name described above, EViews objects have label fields where you can provide extended annotation and commentary. To view these fields, select **View/Label** from the object window:



This is the label view of an unmodified object. Every time you modify the object, EViews by default automatically records the modification in a History field that will be appended at the bottom of the label view.

You can edit any of the fields, except the **Last Update** field. Simply click in the field cell that you want to edit. All fields, except the **Remarks** and **History** fields, contain only one line. The **Remarks** and **History** fields can contain multiple lines. Press ENTER to add a new line to these two fields.

These annotated fields are most useful when you want to search for an object stored in an EViews database. Any text that is in the fields is searchable in an EViews database; see Chapter 6 of the Standard Version documentation, "Querying the Database", page 122, for further discussion.

Copying Objects

There are two distinct methods of duplicating the information in an object: copying and freezing.

If you select **Object/Copy** from the menu, EViews creates a new untitled object containing an exact copy of the original object. By exact copy, we mean that the new object duplicates all the features of the original (except for the name). It contains all of the views and procedures of the original object and can be used in future analyses just like the original object.

You can also copy an object from the workfile window. Simply highlight the object and click on **Object/Copy Selected…**, or click on **Object/Copy Selected…** and specify the destination name for the object.

We mention here that **Copy** is a very general and powerful operation with many additional features and uses. For example, you can copy objects across both workfiles and databases using wildcards and patterns. See Chapter 6 of the Standard Version documentation, "Copy and Rename with Wildcard Characters" on page 112, for details on these additional features.

Copy-and-Pasting Objects

The standard EViews copy command makes a copy of the object in the same workfile. When two workfiles are in memory at the same time, you may copy objects between them using Copy-and-Paste.

Highlight the objects you wish to copy in the source workfile. Then select **Edit/Copy** from the main menu.

Select the destination workfile by clicking on its title bar. Then select **Edit/Paste** from the main menu. EViews will place named copies of all of the highlighted objects in the destination workfile, prompting you to replace existing objects with the same name.

If the source and destination workfiles are of different frequency, frequency conversion (if possible) is applied to series objects before placing them in the destination workfile. See Chapter 6 of the Standard Version documentation, "Frequency Conversion" on page 113, for the exact rules by which frequencies are converted.

Freezing Objects

The second method of copying information from an object is to *freeze* a view of the object. If you click **Object/Freeze Output** or press the **Freeze** button on the object's toolbar, a table or graph object is created that duplicates the current *view* of the original object.

Before you press **Freeze**, you are looking at a view of an object in the object window. Freezing the view makes a copy of the view and turns it into an independent object that will remain even if you delete the original object. A frozen view does not necessarily show what is currently in the original object, but rather shows a snapshot of the object at the moment you pushed the button. For example, if you freeze a spreadsheet view of a series, you will see a view of a new *table object*; if you freeze a graphical view of a series, you will see a view of a new *graph object*.

The primary feature of freezing an object is that the tables and graphs created by freeze may be edited for presentations or reports. Frozen views do not change when the workfile sample or data change.

Deleting Objects

To delete an object or objects from your workfile, select the object or objects in the workfile directory. When you have selected everything you want to delete, click **Delete** or **Objects/Delete Selected** on the workfile toolbar. EViews will prompt you to make certain that you wish to delete the objects.

Printing Objects

Choosing **View/Print Selected** from the workfile window prints the default view for all of the selected objects.

To print the currently displayed view of an object, push the **Print** button on the object window toolbar. You can also choose **File/Print** or **Objects/Print** on the main EViews menu bar.

You may print the default view of more than one object at a time by selecting the objects in the workfile window and choosing **View/Print Selected** from the workfile toolbar.

The print commands normally send a view or procedure output to the current Windows printer. You may specify instead that the output should be saved in the workfile as a table or graph, or

spooled to an ASCII text file on disk. Details are provided in Chapter 10, "Graphs, Tables, and Text Objects" and Appendix B, "Global Options" of the Standard Version documentation.

Storing Objects

EViews provides three ways to save your data on disk. You have already seen how to save entire workfiles, where all of the objects in the workfile are saved together in a single file with the .WF1 extension. You may also store individual objects in their own *data bank* files. They may then be fetched into other workfiles.

We will defer a full discussion of storing objects to data banks until Chapter 6 of the Standard Version documentation. For now, note that when you are working with an object, you can place it in a data bank or database file by clicking on the **Objects/Store to DB…** button on the object's toolbar or menu. EViews will prompt you for additional information.

You can store several objects, by selecting them in the workfile window and then pressing the **Objects/Store selected to DB…** button on the workfile toolbar or menu.

Fetching Objects

You can fetch previously stored items from a data bank. One of the common methods of working with data is to create a workfile and then fetch previously stored data into the workfile as needed.

To fetch objects into a workfile, select **Objects/Fetch from DB…** from the workfile menu or toolbar. You will see a dialog box prompting you for additional information for the fetch: objects to be fetched, directory and database location, as applicable.

See Chapter 6 of the Standard Version documentation, "Fetching Objects from the Database" on page 108, for details on the advanced features of fetch.

Copy and Paste of Object Information

You can copy the list of object information displayed in a workfile or database window to the Windows clipboard and paste the list to other program files such as word processing files or spreadsheet files. Simply highlight the objects in the workfile directory window, select **Edit/Copy** (or click anywhere in the highlighted area, with the right mouse button, and select **Copy**). Then move to the application (word processor or spreadsheet) where you want to paste the list, and select **Edit/Paste**.

If only names are displayed in the window, EViews will copy a single line containing the highlighted names to the clipboard, with each name separated by a space. If the window contains additional information, either because **View/Display Comments (Label + –)** has been chosen in a workfile window or a query has been carried out in a database window, each name will be placed in a separate line along with the additional information.

Note that if you copy and paste the list of objects into another EViews workfile, the objects themselves will be copied.

For More Info...

This concludes our brief introduction to the EViews Student Version. You should now be well on your way to a full understanding of the user-friendly EViews approach to forecasting and statistical analysis.

For further details on any aspect of the program, be certain to use your on-line help system, or consult the complete EViews *User's Guide* provided in .PDF format on your CD-ROM.

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