EViews 9 Getting Started
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Getting Started

Congratulations on your purchase of EViews 9, the premier forecasting and analysis package for Windows-based computers. This guide will lead you step-by-step through the installation and registration procedure for EViews.

(The following discussion describes the installation and registration process for single user copies of EViews and seat licenses purchased under a Volume License Program. Setting up machines to use concurrent use licenses will require a different procedure; for details, please check with your IT support department.)

Installing EViews

You may install EViews 9 by running the installation program downloaded to your computer’s hard drive or contained on the CD-ROM.

32-bit or 64-bit?

Before installing, you should decide whether you wish to install 32-bit EViews, 64-bit EViews, or both.

EViews 9 is available in both 32-bit and 64-bit versions. If you are using 64-bit Windows, you have the option of installing the 64-bit version of EViews in addition to the 32-bit version. Your EViews serial number allows you to have both versions installed on the same 64-bit machine.

Using 64-bit EViews allows you to create and use workfiles that are much larger in size than before. Workfiles can now contain up to 120 million observations and the number of objects is only limited by the amount of memory you have available details). However, if you plan on sharing these workfiles with others, they will need to have 64-bit EViews installed in order to open your workfile.

Installing

If you are installing from the file downloaded to your computer, simply click on the “EViews9Installer.exe” or “EViews9Installer(64-bit).exe” executable program file.

- First, you will be prompted to read and accept the License Agreement, and to designate a directory into which you wish to install your copy of EViews. If you wish to change the default installation directory, click on Browse and navigate to the desired directory. Click on Next to continue.
• Next, you will be asked to enter a name and serial number. Single user license holders should have been provided with a 24-character serial number (on the back of the CD-ROM case or through contact with our office). Those of you who have obtained your copy of EViews as part of a Volume License agreement should obtain a serial number from your license administrator. Enter the serial number and your name as you wish it to appear in your copy of EViews, and click on Next.

• Select the components you wish to install and click on Next.

• Lastly, you will be asked about setting up a Start Menu folder containing shortcuts to the EViews example files folder and the EViews program executable. Clicking on Next starts the actual installation of files onto your computer.

You should note that as part of the installation procedure, EViews will prompt you to register files with the extensions ".WF1", ".PRG", ".EDB", ".AIPZ", and ".UIPZ". If these extensions are already registered, possibly by an earlier version of EViews, you will be prompted to allow EViews 9 to override the existing registration. Registering the extensions is not required, will allow you to double-click on files with these extensions to launch EViews.

Once the installation procedure is completed, click on Finish. If you have elected to create an EViews shortcut, the EViews Start Menu folder will open. To launch EViews, double-click on the EViews 9 icon. Subsequently, you may launch EViews using the shortcut on your desktop or by selecting EViews from the Start Menu shortcuts, if present, by double-clicking on EViews registered file types, or by navigating to the EViews installation directory and double-clicking on the EViews icon.

Registering EViews

What is Registration?

To use EViews 9 on a specific computer, you must first register the program using the serial number obtained with your purchase or obtained from your license administrator. EViews registration is the one-time process of assigning a serial number to a specific machine, sending a unique machine ID number to IHS Global Inc., and writing some information to your Windows registry or Mac application support directory. This is a simple process that can be performed in a few seconds.

The first time EViews is run on a new machine, you will be prompted to register your copy for that machine. On a Windows machine, you may choose to do so immediately, or you can put off registration to a later date, but you must register the copy within 30 days of installation. If you delay registration, you will be prompted to register the copy every time you launch EViews. After 30 days, an unregistered copy of EViews will no longer run.

The EViews single user and standalone licenses allow for a single individual to have exclusive use of copies of EViews residing on multiple machines, or for multiple users to have exclusive
access to a copy of EViews residing on a single machine. For example, a single user may install and register EViews on his or her office computer, home computer and a laptop computer, provided that the use of EViews is exclusive. Note, specifically, that the license terms do not allow two users to share copies of the same license of EViews residing on two machines.

To facilitate the legitimate use of EViews on multiple machines, we allow each EViews single user serial number (one beginning with “90A” or “90B”) or standalone serial number (one beginning with “90S”) to be used in registering up to three machines. If you have exceptional circumstances which require registration on additional machines, please contact our office.

Under the terms of the EViews Volume License agreement, “90C” (volume) license serial numbers may not be used to register multiple machines. Each volume licensed machine running EViews must be assigned a distinct serial number. Thus, licensing an office computer, home computer and laptop computer of a single user will require three distinct Volume License serial numbers.

Once registered on a given machine, EViews will run indefinitely. The copy of EViews may be uninstalled and reinstalled on a registered machine, updated, or moved to a different directory without reregistering the copy for that machine. In the special case where a machine’s hard disk is wiped clean, but no other changes are made to the system, you may simply reregister your copy of EViews. Note that in this circumstance, reregistration on the machine will not count as an additional registration.

If an entire machine or a machine’s hard disk is replaced, you should contact our office to unregister your previous installation prior to reregistering.

**How Do I Register?**

Before starting the registration process, you should first locate your EViews serial number. You most likely will need to enter this number into EViews during the registration procedure.

Next, you should launch EViews as described above.
If the copy of EViews is not registered, EViews will display a warning dialog. The dialog will inform you that EViews is not registered for this machine and, if applicable, will indicate the number of additional days the unregistered copy will continue to run.

You may choose to register in one of two ways: you may use the EViews auto registration features (by clicking on Auto Registration...), or you can manually register (by clicking on Manual Registration...). Selecting either of these two options will open a dialog prompting you for additional information.

(To delay software registration click on the I will register later button. If you select this option and the grace period has not expired, EViews will close the dialog and will operate in the usual fashion. In this way you can use your unregistered copy of EViews as though it were fully registered. If, however, the grace period has expired, your copy of EViews will not run until registered.)

Auto Registration

If your computer is connected to the Internet, auto registration makes registering EViews a snap. Simply click on the Auto Registration... button to display a dialog for entering your registration information.

EViews will fill out as many fields in this dialog as possible. If you wish to continue with the auto registration process, make sure that the entries in the Serial # and Name fields are filled in with the relevant information. When you click on the Register now button, EViews will attempt to contact one of our registration servers and, if successful, will transmit the information contained in the dialog to the server. The server will process the information and the machine will be registered to run EViews.

You should see a message indicating that registration was completed successfully, along with the number of machines that have been registered to the serial number.
If you do not wish to continue with auto registration, click on the Exit without registering button and you will be returned to the main registration screen.

Note that there are some circumstances in which auto registration will fail. Obviously, auto registration will not work if the computer is not connected to the Internet. If registration fails, you should first verify that you have Internet access. Second, your computer may be behind a firewall which does not allow the required communication between your computer and our servers. Furthermore, while unlikely, it is possible that all of our registration servers are temporarily unresponsive.

If you continue to have problems with auto registration, you can choose to register manually as described in the next section, or you can contact us for assistance.

Manual Registration

If auto registration fails or if you prefer not to use the automatic registration features, you may elect to register manually. From the main registration page, click on Manual Registration... to display the manual registration portion of the dialog:

You must fill in the three fields in the dialog: the 2-character serial number, your name, and a 36-character registration key you must first obtain via web browser, phone, or email. EViews will help you by filling in as many fields as possible.
The easiest method of retrieving the registration key is via web browser. If you have access to an Internet connected browser, navigate to

http://www.eviews.com/register/

which will direct you to our registration servers. Follow the links to the registration page, and fill in the form. Enter your name, serial number, and the machine ID number as displayed in this registration dialog into the form. Click on the **Submit the form** button. You will be provided with the 36-character registration key.

Once you have obtained the key, return to the registration dialog in EViews. If necessary, select **Help/EViews Registration...** from the EViews main menu to display the registration page.

Make certain that you have entered your name and serial number exactly as provided when you obtained the registration key, and enter the key in the registration key box. Click **OK** to finish the registration process. Note that you should be able to copy-and-paste the registration key information from your browser into the dialog edit fields.

If all of the information is entered correctly, you will be informed that your registration is complete.

If you do not have access to a working web browser, you can contact our office via email, phone, or standard post to obtain the key:

IHS Global Inc.
Attn: Registration
4521 Campus Drive, #336
Irvine, CA 92612
Email: register@eviews.com
Phone: 949-856-3368

Please provide a registration name, full 24-character serial number, and the machine ID number. We will then provide you with the 36-character registration key.

If you receive the key via email, you should be able to copy-and-paste the key information into the dialog edit fields.

**Contact Information**

Once registration is completed, EViews will display an optional contact page form. You may submit this form to send name, address, phone number, and email information to IHS Global Inc. This information is for our records only and will not be redistributed to others.

**Frequently Asked Questions about Registration**

While the registration procedure should be straightforward, we understand that you may still have questions. The following are answers to the most frequently asked questions:
• How do I find my serial number and other information about my copy of EViews?
Your copy of EViews contains information about your registration status, as well as the product version and build date of the program. To obtain this information, simply select Help/About EViews from the main EViews menu.

• I contacted you and received a key, but the key doesn’t seem to work. What could be wrong?
The most common registration problem results from entering a name or serial number which does not match the key. You should make certain that the name and serial number both match those provided when obtaining a key. Note that while the name is not case-sensitive, it should otherwise be entered exactly as originally provided. If you still experience problems, do not hesitate to contact our office.

• My copy of EViews does not appear to have the features for the edition that I purchased. Do you have to send me a new CD-ROM?
No. Simply contact our office. Once we verify the edition of EViews that you have purchased, you should be able to reregister and upgrade your copy to enable the features.

• I’ve replaced my computers and no longer have available registrations. What should I do?
If there are special circumstances where you need to register an additional machine, please contact our office.

• How do I change the name in which my copy is registered?
Your copy of EViews contains the name in which it was first registered. If you wish to change the registration name, please contact our office.

• What if I have trouble registering?
We do not anticipate that you will have problems registering your copy of EViews using one of the available methods (auto-registration, manual using our web servers, or manual using email or phone). Please feel free to contact our office if you encounter difficulties.

Updating Your Copy of EViews

EViews 9 offers an automatic updating feature that can check for new updates every day, and install an updated version if available. (The automatic update feature can be enabled or disabled from the Options/EViews Auto-Update from Web menu item.)

Alternately, you may manually check for updates from within EViews at any time by selecting Check now... under the EViews Auto-Update from Web menu item, or by selecting EViews Update from the Help menu.
You may also visit the EViews website to check for updates to the EViews program and other components (documentation, sample data, and sample programs). Use your browser to go to:

http://www.eviews.com

and navigate to the downloads area. Downloading updates will not require re-registration of EViews on any previously registered computer. Simply download the update, run the installer, and you will have the latest shipping copy of your software.

Where to Go For Help

Your EViews installation includes documentation in the form of an interactive Help System and PDF versions of the manuals. User-provided online support is available via the EViews Forum.

The Help System

All of the EViews documentation may be viewed from within EViews using the help system. To access the EViews help system, go to the main menu and select Help/EViews Help Topics... or click on Help/Quick Help Reference and select a topic to jump directly to relevant subsections.

The EViews Manuals (PDF Files)

Your EViews installation includes copies of the EViews manuals in Adobe Portable Document Format (.PDF) file format.

If you elected to include the electronic versions of the manuals in your EViews installation, you may access the PDF files from within EViews by clicking on Help in the main EViews menu and selecting the file of interest. Alternately, you may navigate to the “Docs” subdirectory of your EViews installation directory to access the files directly.

Tutorials

To get you started, we have provided a set of PowerPoint tutorials illustrating the basics of EViews. These tutorials are a great way of seeing EViews in action.
http://www.eviews.com/Learning/index.html

The EViews Forum

To supplement the information provided in the manuals and the help system, we encourage you to visit the EViews Online Forum, where you can find answers to common questions about installing, using, and getting the most out of EViews. The EViews Forum is an ideal place to ask questions of and share information with other EViews users.

The forum address is:

http://forums.eviews.com
What’s New in EViews 9

EViews 9 features a wide range of exciting changes and improvements. The following is an overview of the most important new features in Version 9.

**General EViews Interface**
- Command capture from the interactive interface ("Command Capture," on page 13).
- Dockable command and capture window ("Window Docking," on page 14)
- Database and workfile object preview ("Database and Workfile Object Preview," on page 15).

The following are mentioned elsewhere in this document, but touch on interface in important ways.
- Graph pan/zoom ("Graph Pan and Zoom" on page 21).
- Multiple graph viewing slideshow ("Multi-graph Slideshow" on page 23).

**Data Handling**
- A powerful new FRED database interface ("New FRED Database Interface" on page 17).
- Direct read and write access to data stored on cloud drive services ("Cloud Drive Support," on page 18).
- Dated data table template support for saving and importing customized settings ("Dated Data Table Templates," on page 19).
- New frequency conversion methods ("Expanded Frequency Conversion Interpolation Methods" on page 20).

**Graphs, Tables, and Spools**
- Graph pan/zoom ("Graph Pan and Zoom" on page 21).
- Multiple graph viewing slideshow ("Multi-graph Slideshow" on page 23).
- Improved mixed graph type ("Improved Mixed Graph Type" on page 26).
- Rectangle and ellipse drawing ("Rectangle and Ellipse Drawing" on page 27).
• Data-based anchoring of arrows, rectangles, and ellipses ("Data-based Anchoring” on page 28).
• Tables, graphs, and spools may now be saved in LaTeX format ("LaTeX Output” on page 28).

Econometrics and Statistics

Computation
• Automatic ARIMA forecasting of a series ("Automatic ARIMA Forecasting” on page 30).
• Forecast evaluation and combination testing (”Forecast Evaluation” on page 30).
• Forecast averaging (”Forecast Averaging” on page 31).
• VAR Forecasting (”VAR Forecasting” on page 32).

Estimation
• Autoregressive Distributed Lag regression (ARDL) with automatic lag selection (”Autoregressive Distributed Lag (ARDL) Models” on page 34).
• Maximum Likelihood and GLS ARMA estimation (”ML and GLS ARMA” on page 35)
• Fractional Integration (ARFIMA) model estimation (”Fractional Integration (ARFIMA)” on page 36).
• Pooled mean group estimation of panel data ARDL models (”Panel ARDL and Pooled Mean Group (PMG) Estimation” on page 37).
• Threshold regression (”Threshold Regression” on page 37).
• New optimization engine and associated coefficient covariances (”Optimization Engine and Coefficient Covariances” on page 38).

Testing and Diagnostics
• Unit root tests with a structural break (”Unit Root Tests with a Breakpoint” on page 39).
• Cross-section Dependence Tests (”Panel Cross-section Dependence Tests” on page 41).

Other Features
• New functions for generating series (”Series Generating Functions” on page 44).
• Added matrix language tools (”Matrix Language Tools” on page 45).
• Enhanced table support (”Table Tools,” on page 46).
• New general information tools ("General Information Tools," on page 46).
• New object data members ("Object Data Members," on page 47).
• List of new or updated global commands ("Updated Command List" on page 48).
• List of new or updated object commands ("Updated Object List" on page 49).

EViews 9 Compatibility Notes

• Compatibility notes for users of EViews 9 ("EViews 9 Compatibility Notes" on page 53).

General EViews Interface

The general EViews interface has been improved in a number of important ways. The following are some of the highlights.

Command Capture

EViews offers command capture for most object views and procedures, and a large number of interactive operations. With command capture, when you perform an operation using the dialogs or user-interface, EViews will save the equivalent text command for display and export.

You can copy-and-paste the contents of the capture window, or you can save the contents to a file. Right-clicking in the window brings up a menu for copying or clearing the window, saving the contents to a file on disk, or opening a new, untitled program containing the contents of the window.

To display the command capture window or set focus on the window, click on Window/Display Command Capture Window from the main EViews menu.
Note that not all interactive operations in EViews are capture enabled. Among the notable exceptions are some types of graph creation and customization, object view graph customization, and individual cell editing for tables and spreadsheets.

- For additional discussion, see “Command Capture” on page 3 of the Command and Programming Reference.

Window Docking

The EViews 9 command and capture windows are dockable, hideable, and floatable.

Dockable and hideable windows allow you to move frequently used windows out of the way while keeping them close at hand. They offer space saving convenience which is particularly valued when working with smaller screen devices like laptops.
Floatable windows allow you to move them out of the way of your work. You may even go so far as to float a window outside of the EViews frame.

- For discussion, see “Command and Capture Window Docking” on page 6 of the Command and Programming Reference.

Database and Workfile Object Preview

In earlier versions of EViews, browsing through the contents of a database or workfile could be tedious as it required opening and closing each object that you wished to examine.

EViews 9 offers you the ability to preview objects contained in a database or a workfile. With the preview tool, you may quickly browse through a number of objects. You may use the preview to quickly scroll through a preview of each object, viewing metadata (name, type, description, frequency, last update, source, units, etc.) and object type-specific information (for example, series will show observation data and a small graph while equations will show estimation output).
Data Handling

EViews 9 offers a variety of new features for working with data.

Enhanced import and linking of data

In EViews 9, series objects can be linked to an object in another workfile and to any external data source that can be imported into EViews (e.g. Excel file, Text file, ODBC database, etc). These linked series may be unlinked and re-linked as desired and the data refreshed when the workfile is opened, or on request.

The Manage Links and Formulae dialog has been redesigned to help you manage these new data links.
New FRED Database Interface

You can use the dialog to examine and edit the link properties, refresh the data, and break or restore the links.

- For discussion, see “Breaking links” on page 248 of User’s Guide I.

New FRED Database Interface

EViews 9 offers an updated interface to the FRED data service provided by the Federal Reserve Bank of St Louis. The new interface includes a custom browser for navigating the available FRED data and adds support for retrieval of historical releases.

To use the new interface, select File/Open Database... from the main EViews menus and open the all new custom FRED database. The browser interface allows you to find data available within FRED by navigating through a set of nested folders. Click on the folder icons to drill down into subtopics:
In addition, the FRED interface offers a number of useful tools for working with your FRED database, including keyword search, popularity and update ordering, filtering, vintage handling, and more.

- See the discussion in “FRED” on page 352 of User’s Guide I.
- See also `dbopen` (p. 344) in the Command and Programming Reference.

**Cloud Drive Support**

You may now access your Box, Dropbox, Google Drive, or OneDrive drive from within EViews. The **File Open**... and **File/Save As**... dialogs allow you to configure access to your accounts, and to read and write files directly from your cloud drives.
See the discussion of “Cloud Drive Support” on page 92 of User’s Guide I.

See also `wfopen` (p. 513), `wfsave` (p. 527), `pageload` (p. 438), and `pagesave` (p. 440) in the Command and Programming Reference.

Dated Data Table Templates

EViews 9 now allows you to store and load all of your dated data table settings to and from a dated data template.
Expanded Frequency Conversion Interpolation Methods

EViews 9 supports new low-to-high frequency conversion methods as well as modification to the existing methods.

The new conversion methods are Point, Denton, Chow-Lin and Litterman. Each of these methods supports a number of different match points (i.e. how the periods on the source page are connected to those in the destination page), including First, Last, Sum, and Average. The existing Linear and Cubic methods have been extended to allow matching on First as well as Last.

For documentation, see:

- See the discussion of "Dated Data Table Templates" on page 520 of User's Guide I.
- See also Group::ddloadtmp1 (p. 302), and Group::ddsavetmp1 (p. 305) in the Object Reference.
Graph Pan and Zoom

Panning and zooming is available on graphs and graph views that feature the observation slider bar (i.e., those graph views that allow for subsample display). You may use these features to focus on particular regions of the graph, much like cropping a photograph.

To zoom, left-click on the graph and drag the cursor to draw a box around the area into which you would like to zoom.

• For additional detail, see “Frequency Conversion” on page 158 of User’s Guide I.

• See also copy (p. 327) in the Command and Programming Reference.

Graphs, Tables, and Spools
then release the mouse. The display changes to show only the area within the box and the observation slider bar and axis labels will change to reflect the modified display.

Note that there will be no indication that observations from the original graph have been trimmed away.

To pan, right-click on the graph, and when the cursor change to a hand, drag the image and release when the display shows the portion of the graph that is of interest.
Note that zooming and panning does not change the graph, only the display of the portion of the graph in the window. The observation slider bar and axis labels will change to reflect the modified display. Freezing the graph will take a snapshot of the current display.

To restore the original graph display, press ESC.

- For related discussion, see “The Graph Sample” on page 595 of User’s Guide I.

## Multi-graph Slideshow

EViews 9 makes viewing multi-graphs easier via the introduction of a graph slideshow.

When working with multiple graphs in a single graph frame one sometimes finds that the individual graphs are too small to see any detail. Consider, for example, the graph of impulse responses for a three variable VAR:

EViews 9 allows you to zoom in on the individual graphs and to display the contents of the graph in a slideshow format. Click on the **Zoom** button on the toolbar to enable the slideshow:
Here we see the zoom view. On the left is a gallery of the individual graphs; on the right is a larger display of the selected graph. You can page through the individual graphs using the arrow keys or Page Up/Page Down to select the next graph, or the Home and End keys to move to the first or last graph. Alternately, you can click on a gallery item to jump to that graph.

Click on ESC to exit zoom mode.

If you wish to enable the slideshow for a subset of the graphs, return to the original graph and select the graphs of interest by clicking or drag clicking to select the desired items,
then press the **Zoom** button or right-mouse click and select **View/Selected graphs**. EViews will show the gallery for just the selected items:

- See the related discussion in “Graphing Multiple Series (Groups)” on page 584 of *User’s Guide I*. 
Improved Mixed Graph Type

EViews 9 offers an entirely new interface where you can flexibly specify the type of each graph in the mixed display.

Previous versions of EViews allowed you to display a mixed graph type where the first series or column of data was depicted using a bar, spike, or area plot, and the remaining data was plotted using line graphs. There was no way to mix more than two graph types, nor was there a way to draw with more than one of the first graph type.

The new EViews interface allows you to specify the type of each graph element. Set the first series to spike, the second to line, and the third to area. Or mix up the assignment. The choice is up to you.

When you select Mixed as your Basic Type, the left-hand side tree adds an additional page under Graph Type for Mixed settings. When you click on this node, the right-hand side of the dialog changes to display the settings for each type:

You may, for example, graph your group data with a spike for the first series, a line for the second, and an bar for the remaining two.
For discussion, see “Drawing Rectangles and Ellipses” on page 713 of User’s Guide I for discussion.

See also, addellipse (p. 232) and addrect (p. 234) in the Object Reference.
Data-based Anchoring

By default, the positions of arrow and text objects in a graph are specified in virtual inches relative to the top left corner of the graph. While useful for some types of drawing, this approach is problematic when one wishes to place objects at particular data points or dates in the graph as in, for example, identifying an outlier or the observation value at a notable date. For one, placing the object is quite difficult programmatically as there is no clear way of translating from data values or observations to virtual inch offset. Moreover, if one changes the axes ranges, sample, or aspect ratio of the graph, the absolute positioning method breaks down.

You can attach arrows and the new rectangle and ellipse drawing objects to fixed data/date points within the graph. You can, for example, choose to place your object at the point defined by the observation for 1990m01 and the maximum value of X.

Similarly, sizes of objects may also be expressed in terms of observations and data units, so that you can draw a rectangle that is “2 years wide” and “10.5” data units tall.

In addition to being easier to specify programmatically, if, you then alter the graph frame or axes, the object will move with the data in the graph.

- See also addarrow (p. 229), addellipse (p. 232), addrect (p. 234) in the Object Reference.

LaTeX Output

You can now save your table, graph, and spool output in LaTeX format.
This feature is available whenever you save a table, graph, or spool to disk (using commands, the table or graph save to disk proc, or the right-mouse button save from a table or graph view). In all of these cases, you should select change the File type combo to “LaTeX file” to see the available options.

The options to save as PDF are included in the standard save dialogs for graphs, tables, and spools. Right-click on the graph, table, or spool object and select **Save graph to disk…**, **Save table to disk…**, or **Save to Disk**, respectively. The standard file save dialogs will appear. Select PDF from the **File Type** drop-down.

LaTeX also appears as a supported output type for table objects in EViews 9:

For command line documentation

- see **Graph::save** (p. 262) in the **Object Reference**
- see **Table::save** (p. 766) in the **Object Reference**
What’s New in EViews 9

Econometrics and Statistics

EViews 9 offers a exciting new additions and improvements to its set of econometric and statistical features. The following is a brief outline of the most important new features, followed by additional discussion and pointers to full documentation.

Automatic ARIMA Forecasting

Automatic ARIMA forecasting is a method of forecasting values for a single series based upon an ARIMA model.

Although EViews provides sophisticated tools for estimating and working with ARIMA models using the familiar equation object, there is considerable value in a quick-and-easy tool for performing this type of forecasting. EViews 9 introduces an automatic ARIMA forecasting series procedure that allows the user to quickly determine an appropriate ARIMAX specification and use it to forecast the series into the future.

You will find this feature using the Proc menu for a series object.

• For further documentation, see “Automatic ARIMA Forecasting” on page 449 of User’s Guide II for discussion.

• See also Series::autoarma (p. 531) in the Object Reference.

Forecast Evaluation

When constructing a forecast of future values of a variable, economic decision makers often have access to different forecasts; perhaps from different models they have created themselves or from forecasts obtained from external sources. When faced with competing fore-
casts of a single variable, it can be difficult to decide which single or composite forecast is “best”. Fortunately, EViews 9 provides tools for evaluating the quality of a forecast which can help you determine which single forecast to use, or whether constructing a composite forecast by averaging would be more appropriate.

Given actual data and one or more sets of forecasts for an evaluation sample, EViews computes four different measures of forecast accuracy; RMSE (Root Mean Squared Error), MAE (Mean Absolute Error), MAPE (Mean Absolute Percentage Error), and the Theil Inequality Coefficient.

In addition, EViews can compute the Combination Test, or Forecast Encompassing Test (Chong and Hendry, 1986; Timmermann, 2006) for evaluating whether averages of forecasts perform better than the individual forecasts.

To perform forecast evaluation in EViews, you must have a series containing the observed values of the variable for which you wish to evaluate forecasts. To begin, open up the series and click on View/Forecast Evaluation..., which will open the Forecast Evaluation dialog box:

- For documentation see “Forecast Evaluation” on page 397 of User’s Guide I for additional discussion.
- See also Series::forceval (p. 553) in the Object Reference.

Forecast Averaging

Economic forecasters often have a variety of different models and forecasts of the same variable from which to choose. Traditionally the forecasting decision was to pick which single forecast was “best” out of the individual forecasts available. However, a number of studies (Timmermann 2006) have shown that averaging forecasts is more accurate than choosing a single best forecast.
Forecast averaging, or forecast combining, is a methodology for combining multiple forecasts into a single forecast. EViews 9 offers a number of easy-to-use tools for performing forecast averaging using simple mean, least squares, mean square error, mean square error ranks, smoothed AIC, approximate Bayesian model averaging, trimmed mean and simple median methods.

To perform forecast averaging in EViews, you must start with a series representing the data to be forecasted. Some of the forecast weighting techniques require actual data to calculate the weights, and in these cases this series should contain actual values for the variable being forecasted for at least some of the observations for which forecast values are available.

Open the series and click on **Proc/Forecast Averaging...**, which will open the **Forecast Averaging** dialog box:

![Forecast Averaging dialog box]

The **Forecast data objects** box specifies the forecasts to be used for averaging. Forecasts can be entered either as a collection of series (in which case the names of the series, a series naming pattern, or the name of a group are entered), or as a list of equation objects. If equation objects are entered, EViews will automatically perform a dynamic forecast over the forecast period from each of those equation objects to generate the forecast data.

For documentation see:
- See “Forecast Averaging” on page 458 of *User’s Guide I* for additional discussion.
- **Series::forcavg** (p. 551) in the *Object Reference*.

**VAR Forecasting**

Previously, to forecast from an estimated VAR object, you needed to first make an EViews model object from the VAR and then solve the model. This procedure was cumbersome, especially for those unaccustomed to working with models and scenarios.

In EViews 9, you may produce forecasts directly from an estimated VAR object. Click on the **Forecast** button or select **Proc/Forecast** to display the forecast dialog:
Fill out the dialog as desired and click on **OK**. EViews performs the forecast and, if appropriate displays output:

In this case, the output consists of a spool containing the forecast evaluation of all of the series in the VAR, along with individual graphs of the forecasts along with the corresponding actauls series.

- For additional information, see "Forecasting" on page 635 in *User’s Guide II*. 
Autoregressive Distributed Lag (ARDL) Models

EViews 9 offers new tools for estimating and examining the properties of Autoregressive Distributed Lag (ARDL) models. ARDLs are standard least squares regressions which include lags of both the dependent variable and independent variables as regressors.

Although ARDL models have been used in econometrics for decades, they have gained popularity in recent years as a method of examining long-run and cointegrating relationships between variables (Pesaran and Shin, 1999; Pesaran, Shin and Smith, 2001).

EViews offers specialized tools for estimating ARDL models, including built-in lag-length selection methods, cointegrating relationship estimation, and Bounds testing for long-run relationship.

To estimate an ARDL model using the ARDL estimator, open the equation dialog by selecting Quick/Estimate Equation..., or by selecting Object/New Object.../Equation and then selecting ARDL from the Method dropdown menu. EViews will then display the ARDL estimation dialog:

- See also Var::fit (p. 829) in the Object Reference.
- See also Var::forecast (p. 830) in the Object Reference.

- See also Equation::ardl (p. 45) in the Object Reference.
ML and GLS ARMA

EViews now allows you to estimate ARMA models specified by list using ML or GLS (in addition to the previously existing CLS-based estimator). Estimation of these models features the use of the Kalman filter to evaluate the exact likelihood (Hamilton 1994).

In the equation object dialog, click on the **Options** tab. The **ARMA** section in the upper right-hand corner of the dialog presents new options for estimating your ARMA model.

In addition to a choice between ML, GLS, or CLS estimation of ARMA methods, you will have a choice of methods for determining ARMA starting values, optimization method, and the approach to computing the estimate of the coefficient covariance.

- For additional discussion, see Chapter 22. “Time Series Regression,” on page 87 of *User’s Guide II*.
- See also **Equation::ls** (p. 114) in the *Object Reference*. 
Fractional Integration (ARFIMA)

Stationary processes are said to have long memory when autocorrelations are persistent, decaying more slowly than the rate associated with ARMA models. Modeling long term dependence is difficult for standard ARMA specifications as it requires non-parsimonious, large-order ARMA representations that are generally accompanied by undesirable short-run dynamics (Sowell, 1992).

One popular approach to modeling long memory processes is to employ the notion of fractional integration (Granger and Joyeux, 1980; Hosking, 1981). A fractionally integrated series is one with long-memory that is not \( I(1) \). By combining fractional integration with an ARMA specification we obtain a fractional ARIMA (ARFIMA) model. The ARFIMA model includes a fractional integration parameter \( d \) that controls the degree of long-run dependence, allowing for the separate modeling of the short and the long-run dynamics.

EViews supports exact maximum likelihood estimation of ARFIMA models via ML or GLS using efficient algorithms as described in Sowell (1992) and Doornik and Ooms (2003). Among the supported features are automatic intialization of the integration parameter \( d \) estimates using the Geweke and Porter-Hundlak (1983) log-periodogram regression, and concentration of the likelihood with respect to regression coefficients and scale.

To specify an ARFIMA model you should specify your ARMA model by list, then include “D” as a regressor to instruct EViews to estimate an integration term.

- For additional discussion, see Chapter 22. “Time Series Regression,” on page 87 of User’s Guide II.
- See also Equation::ls (p. 114) in the Object Reference.
Panel ARDL and Pooled Mean Group (PMG) Estimation

EViews 9 supports estimation of the Pooled Mean Group (PMG) estimator of Pesaran, Shin and Smith (PSS, 1999) for ARDL models with individual effects. This model is particularly popular in panel settings where the number of periods is large, since alternative GMM estimators may not be appropriate in those settings.

The PMG takes the cointegration form of the simple ARDL model and adapts it for a panel setting by allowing the intercepts, short-run coefficients and cointegrating terms to differ across cross-sections.

Threshold Regression

EViews 9 estimates threshold regression models (TR) which are linear regression models where the coefficients on explanatory variables may change as a threshold variable crosses boundary values. This class of model includes the popular threshold autoregressive models (TAR).

To estimate a threshold equation, select Threshold Regression from the equation estimation method combo.

See also Equation::threshold (p. 161) in the Object Reference.

Optimization Engine and Coefficient Covariances

In EViews 9, we have integrated an all new estimation engine into many familiar EViews estimators.

One important benefit of the use of the new optimization engine is the availability of numeric second derivative estimates of the Hessian in cases where they were not previously available. Having second derivatives allows us additional choice in the estimators of the coefficient covariance, both through alternative estimators of the information matrix and through an expanded ability to compute Huber-White type sandwich estimators.

The following existing EViews estimators have been updated to support the new estimation engine: single equation nonlinear least squares and ARMA, binary, count, ordered, censored, ARCH (single equation and system), switching regression, GLM, Heckman selection, system FIML, state space, user-defined likelihood.

- See “Optimization Method” on page 1006 in the User’s Guide II for discussion.
- See also the command entries for the various estimators, for example, Equation::ls (p. 114) in the Object Reference.

Unit Root Tests with a Breakpoint


EViews offers unit root tests under a variety of scenarios for the type and timing of the break and different data trend specifications. To compute a unit root test with breakpoint select View/Breakpoint Unit Root Test... from the series menu.
Fill out the dialog as desired, and click on OK. EViews will display the test results, and will, by default, display a spool object that contains the test results table, and graphs of the breakpoint selection results,
Panel Cross-section Dependence Tests


To perform a panel series test, open a panel series and select View/Cross-section Dependence Test. To perform a test on the residuals from an estimated panel equation, select View/Residual Diagnostics/Cross-Section Dependence Test:

For discussion, see “Unit Root Tests with a Breakpoint” on page 539 in the User’s Guide II.

See also Series::buroot (p. 537) in the Object Reference.
EViews will compute the relevant statistics, and display the results in tabular form:

- For discussion, see “Panel Cross-section Dependence Test” on page 872 of User’s Guide II.
- See also Equation::cdtest (p. 55) in the Object Reference.

Panel Random Effects Tests

EViews 9 allows you to test for individual and time unobserved random effects in a panel or pool equation. EViews computes the Breush-Pagan LM (1980), Baltagi and Li (1999), Honda

To compute the test statistics, select View/Fixed-Random Effects Testing/Omitted Random Effects - Lagrange Multiplier from an estimated panel equation:

The results for all of the tests are displayed in the object window:
For discussion, see "LM Tests for Random Effects" on page 865 of User’s Guide II.

See also Equation::rcomptest (p. 145) in the Object Reference.

Other Features

There are a number of other features and improvements that are not mentioned above.

Series Generating Functions

These functions return cumulative values for each observation:

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>@cummedian(arg1[, s])</td>
<td>Cumulative median of arg1.</td>
</tr>
<tr>
<td>@cummedianb(arg1[, s])</td>
<td>Backward cumulative median of arg1.</td>
</tr>
<tr>
<td>@cumquantile(arg1, arg2[,s])</td>
<td>Cumulative arg2 quantile of arg1.</td>
</tr>
<tr>
<td>@cumquantileb(arg1, arg2[,s])</td>
<td>Backward cumulative arg2 quantile of arg1.</td>
</tr>
</tbody>
</table>
Matrix Language Tools

Descriptive Statistics

The following function has been updated to support alpha series.

\[ \text{@obs}(x[,s]) \]
the number of non-missing observations for \( X \) in the current sample.

Element Information

The following functions have been updated to support alpha series.

<table>
<thead>
<tr>
<th>Function</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>@first(x)</td>
<td>first element</td>
<td>returns the value of the first non-missing value in the series for the current sample.</td>
</tr>
<tr>
<td>@ifirst(x)</td>
<td>index of first element</td>
<td>returns the workfile index of the first non-missing value in the series for the current sample.</td>
</tr>
<tr>
<td>@ilast(x)</td>
<td>last element</td>
<td>returns the workfile index of the last non-missing value in the series for the current sample.</td>
</tr>
<tr>
<td>@last(x)</td>
<td>index of last element</td>
<td>returns the value of the last non-missing value in the series for the current sample.</td>
</tr>
</tbody>
</table>

Matrix Language Tools

Matrix Import

The engine for importing data into a matrix object has been updated to support Excel XML, HTML, and web-based files, and offers a number of additional features:

importmat.............imports data from a foreign file into a matrix object in the current workfile.

Matrix Functions

EViews 9 includes new matrix utility functions, for finding the maximal and minimal values of a matrix or vector. These functions mirror those previously available for a series:

@maxes.................returns a vector of maximal values of an object, arranged from high to low (p. 678).

@mins...............returns a vector of minimal values of an object, arranged from low to high (p. 679).
String and Svector Functions

These new string functions make it easier to work with s_vectors and to move data between s_vectors and string lists:

- `@vcat` ................. vertically concatenate two matrix objects (*new svector support*) (p. 694).
- `@wjoin` ................. return a space delimited string list containing the contents of an svector (p. 642).
- `@wsplit` .............. returns an svector containing elements of a string list (p. 647).

Table Tools

Program support for working with tables has been enhanced in EViews 9:

- The `ttom` (p. 691) function allows you to export the numeric contents of a table into a matrix object, making it easier to extract results from the table.
- You may now import data from external sources directly into an EViews table object using `importtbl` (p. 398). The import engine supports Excel XML, HTML, and web-based files, and offers a number of additional features.

General Information Tools

General Functions

In addition, you may use the following new function to obtain information about your EViews application environment:

- `@datapath` .......... returns a string containing the value of the current EViews data directory (p. 702).
- `@linepath` .......... returns a string containing the value of the program currently being executed (p. 711).
- `@runpath` .......... returns a string containing the location of the program currently being executed (p. 714).

Date Functions

These new string functions return time zone information:

- `@localt` .......... returns the local time zone representation of a point in time input in Coordinated Universal Time (UTC) (p. 620).
@tz ..........................converts a point in time from the source time zone into the destination time zone (p. 633).
@tzlist .....................converts a point in time from the source time zone into the destination time zone (p. 633).
@tzspec .....................returns time zone information for the first time zone whose description contains the piece of text (p. 634).
@utc ..........................returns the Coordinated Universal Time (UTC) value for a point in time input using a local time zone value (p. 635).

(All in the Command and Programming Reference.)


Dialog Display Functions
There is a new function for creating your own dialog controls:

@uimlist .....................display a dialog with a multiple-select listbox control (p. 727).

(All in the Command and Programming Reference.)

Object Data Members
EViews 9 offers an expanded set of object data members that provide access to information about the object.

Equation Data Members
Scalar Values
@breaks .....................number of breakpoints in a breakpoint least squares equation.
@thresholds ..............number of thresholds in a threshold regression.

Vectors and Matrices
@ardlcoint ..............returns a coef containing coefficients from the cointegrating relationship form of an ARDL estimation.
@ardlsrcoefs ..........returns a matrix where each row corresponds to an individual cross-section’s short-run coefficients. Only applicable for PMG/ARDL estimation.
@ardlsrse ..............returns a matrix where each row corresponds to an individual cross-section’s short-run coefficient standard errors. Only applicable for PMG/ARDL estimation.

String Values
@ardlcointsubst .......returns string representation of the cointegration form of an ARDL equation with substituted coefficients.
Graph Data Members

Scalar Values

@axispos(value, axis) .....returns the location in virtual inches of the specified data value on the graph. value is in the same units as the specified axis. When specifying a date for value, the string must be quoted. Acceptable values for axis are "t", "l", "b", "r" for top, left, bottom, right.

Updated Command List

(Unless otherwise specified, all of the object views and procedures are in Command and Programming Reference.)

Commands

importmat ............ imports data from a foreign file into a matrix object in the current workfile (p. 392).
importtbl .............. imports data from a foreign file into a table object in the current workfile (p. 398).
pageload................ load one or more pages into a workfile from a workfile or a foreign data source (new features) (p. 438).
wfopen ................. reads in a previously saved workfile from disk, or reads the contents of a foreign data source into a new workfile (new features) (p. 513).

Graph Creation Commands

mixed ................ mixed type graph (p. 909) in the Object Reference.

Interactive Use Commands

arch ..................... restimate autoregressive conditional heteroskedasticity (ARCH and GARCH) models (new optimizer support) (p. 291).
binary .................. binary dependent variable models (includes probit, logit, gompit) models (new optimizer support) (p. 299).
censored ............... estimate censored and truncated regression (includes tobit) models (new optimizer support) (p. 306).
fit ....................... static forecast from an equation (p. 358).
forecast ............... dynamic forecast from an equation (p. 360).
glm ....................... estimate a Generalized Linear Model (GLM) (new optimizer support) (p. 365).
ls ....................... equation using least squares or nonlinear least squares, including ARMA estimation (new optimizer support and updated to support ML-ARMA and ARFIMA estimation) (p. 410).
heckit ..................estimate a selection equation using the Heckman ML or 2-step method *new optimizer support* (p. 376).

ordered .................ordinal dependent variable models (includes ordered probit, ordered logit, and ordered extreme value models) *new optimizer support* (p. 424).

switchreg ..............exogenous and Markov switching regression *new optimizer support* (p. 484).

threshold...............threshold least squares, including threshold autoregression (p. 489).

Matrix Commands

stom .....................Converts series or group to vector or matrix after removing observations with NAs *new series/svector support* (p. 688).

stomna ..................Converts series or group to vector or matrix without removing observations with NAs *new series/svector support* (p. 689).

ttom .......................fills a matrix with the numeric contents of a table (p. 691).

Programming Commands

addin .....................register a program file as an EViews Add-in *updated* (p. 700).

Updated Object List

(Unless otherwise specified, all of the object views and procedures are in Object Reference.)

All Objects

*Object Proc*

clearhist ...............clear the contents of the history attribute (p. 7).

Equations

*Equation Methods*

ardl ......................least squares with autoregressive distributed lags (p. 45).

binary ....................binary dependent variable models (includes probit, logit, gompit) models *new optimizer support* (p. 49).

censored .................estimate censored and truncated regression (includes tobit) models *new optimizer support* (p. 58).

glm .........................estimate a Generalized Linear Model (GLM) *new optimizer support* (p. 91).

ls .........................equation using least squares or nonlinear least squares, including ARMA estimation *new optimizer support and updated to support ML-ARMA and ARFIMA estimation* (p. 114).

heckit ..................estimate a selection equation using the Heckman ML or 2-step method *new optimizer support* (p. 104).
ordered............... ordinal dependent variable models (includes ordered probit, ordered logit, and ordered extreme value models) (new optimizer support) (p. 132).

switchreg .......... exogenous and Markov switching regression (new optimizer support) (p. 155).

threshold.......... threshold least squares, including threshold autoregression (p. 161).

**Equation Views**

boundstest......... perform the Pesaran, Shin and Smith (2001) bounds test of long-run relationships from an ARDL estimated equation (p. 51).

cdtest ................. test for the presence of cross-sectional dependence of the residuals of a panel equation (p. 55).

cointgraph......... view a graph of the estimated cointegrating relation form of an ARDL estimated equation (p. 67).

cointrep............. view the estimated cointegration form and the long-run coefficients table of an ARDL estimated equation (p. 76).

icgraph............. display a graph of the selection criteria for the top 20 models observed as part of model selection during estimation (p. 107).

ictable............. display a table of the log-likelihood and selection criteria for the top 20 models observed as part of model selection during estimation (p. 108).

rcomptest.......... test for the presence of cross-sectional and time period random effects using the residuals of a panel equation (p. 145).

**Equation Procs**

fit....................... static forecast from an equation (p. 86).

forecast ............... dynamic forecast from an equation (p. 89).

makecoint............ create a series containing the estimated cointegrating relationship from an ARDL estimated equation (p. 121).

**Graphs**

**Graph Procs**

addarrow............... draw a line or arrow on a graph (with new features) (p. 229).

addeclipse............. draw an ellipse on a graph (p. 232).

addrrect............... draw a rectangle on a graph (p. 234).

save .................. save graph to a graphics file (with new LaTeX save) (p. 262).

**Groups**

**Group Views**

uroot.................. carry out (panel) unit root tests on a group of series (update) (p. 339).
Group Proc

- **ddloadtmpl**: load the settings from a dated data table (p. 302).
- **ddrowopts**: set the individual row options for the dated data table view of the series in a group (p. 303).
- **ddsavetmpl**: load the settings from a dated data table (p. 305).
- **ddtabopts**: set the table default options for the dated data table view of the series in a group (p. 306).
- **insertobs**: shift the observations of the series up or downwards, inserting blank observations (p. 317).

LogL

**LogL Methods**

- **ml**: maximum likelihood estimation *(new optimizer support)* (p. 364).

Matrices

**Matrix Proc**

- **setcollabels**: set the column headers in a matrix object spreadsheet (p. 398).
- **setrowlabels**: set the row headers in a matrix object spreadsheet (p. 401).

Models

**Model Proc**

- **addassign**: assign add factors to equations (p. 409).
- **addinit**: initialize add factors (p. 410).
- **addover**: set the active scenario add factor overrides (p. 411).
- **unlink**: break links in model specification (p. 441).
- **update**: update model specification (p. 442).

Pool Views

- **uroot**: carry out (panel) unit root tests on a pool series (p. 483).

Series

**Series Views**

- **buroot**: perform unit root tests which allow for a single breakpoint (p. 537).
- **cdtest**: test for the presence of cross-sectional or time series dependence of the panel series (p. 539).
- **forceval**: evaluate different forecasts of a series, and perform the forecast combination test (p. 553).
- **uroot**: carry out unit root tests on a series or panel structured series (p. 595).
Series Procs

autoarma............ forecast from a series using an ARIMA model with the specification
of the model selected automatically (p. 531).
forcavg.............. average forecasts of a series (p. 551).
insertobs.......... shift the observations of the series up or downwards, inserting
blank observations (p. 559).
makepanpcomp .... save the scores from a principal components analysis of a panel
series (p. 563).
x13 .................. seasonally adjust series using the Census X-13ARIMA-SEATS
method (p. 609).

Spools

Spool Procs
save .................... save spool object to disk as a CSV, tab-delimited ASCII text, RTF,
PDF file, or LaTeX (with new LaTeX save) (p. 664).

Sspace

Sspace Methods
ml ......................... maximum likelihood estimation or filter initialization (new optimizer support) (p. 637).

System

System Methods
arch ...................... estimate generalized autoregressive conditional heteroskedasticity
(GARCH) models (new optimizer support) (p. 722).
fiml ...................... full information maximum likelihood (new optimizer support)
(p. 732).

Tables

Table Procs
save ...................... save table object to disk as a CSV, tab-delimited ASCII text, RTF,
HTML, PDF, or LaTeX file (with new LaTeX save) (p. 766).

VAR

Var Procs
fit ......................... produce static forecasts from an estimated VAR (p. 829).
forecast ................ produce dynamic forecasts from an estimated VAR (p. 830).
EViews 9 Compatibility Notes

The following discussion describes EViews 9 compatibility issues for users of earlier versions.

Workfile Compatibility

With few exceptions, EViews 9 workfiles are backward compatible with EViews 8. Note that the following objects are new or have been modified in Version 9:

- Equation objects estimated with methods that employ new features (threshold regression, ARDL, ML ARMA, ARFIMA.)

If you have saved workfiles containing any of the above objects and open them in EViews 8 or earlier, EViews will delete the incompatible object and notify you that one or more objects were not read. If you then save the workfile, you will lose the objects. We recommend that you make a copy of any workfiles that contain these objects if you would like to use these workfiles in earlier versions of EViews.

In contrast, there are some estimation methods that are new in EViews 9, but are deemed sufficiently compatible. In this case, you can open the workfile in the older version, but some compatibility issues remain.

For example, if you estimate a nonlinear least squares equation using the new optimization engine and method (say, BFGS), the original equation will be read in older versions of EViews, but the new options will be ignored in the earlier versions of EViews. If you then work with the equation in the earlier version, EViews will be unaware that newer methods were employed. Note in particular that this implies that you can perform a Wald test in EViews 8 using coefficient covariance methods that are not available in EViews 8. We recommend some caution in mixing results between versions.