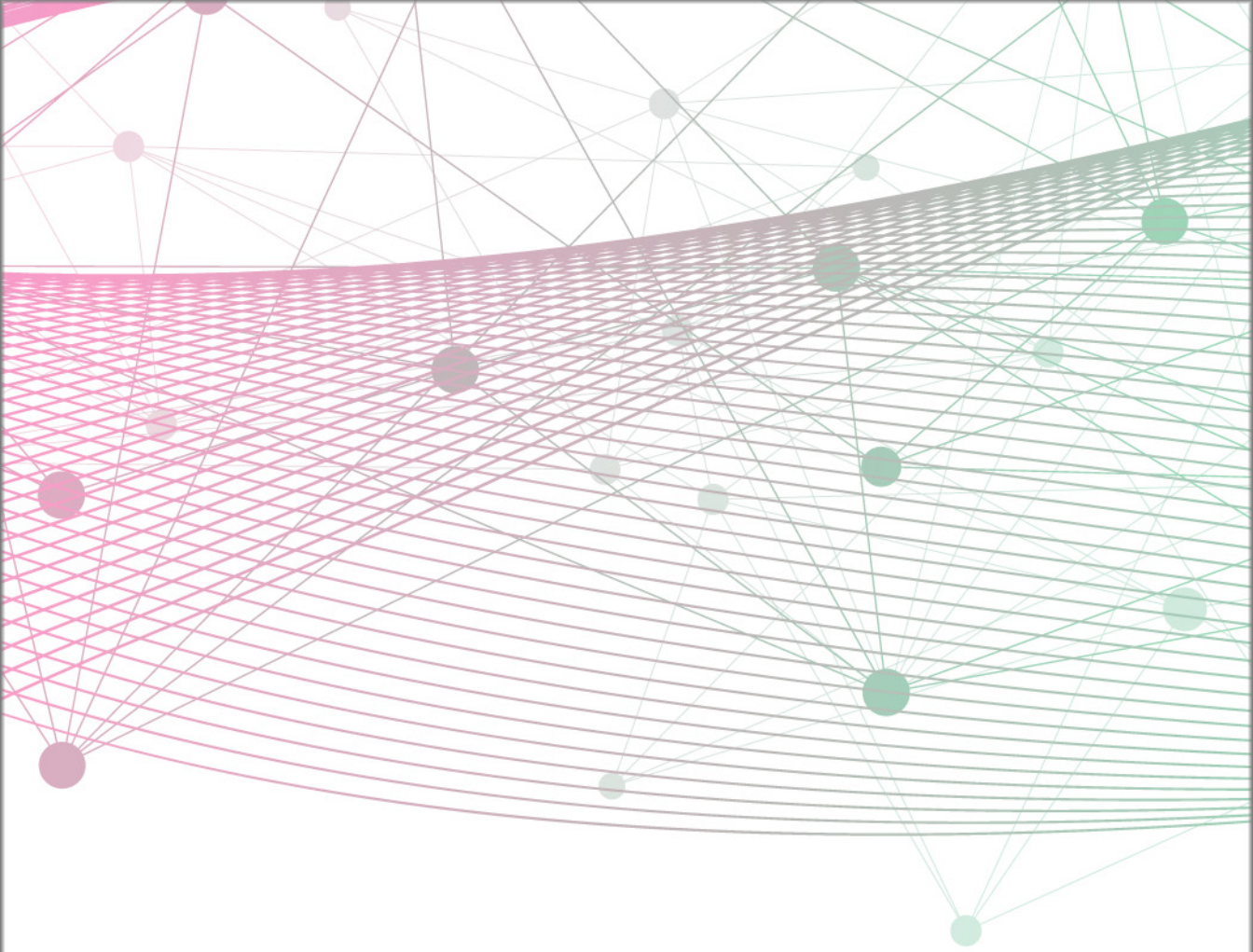

EViews® 12

Getting Started

IHS Markit®

EViews 12 Getting Started

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Disclaimer

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November 10, 2020

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Getting Started

Congratulations on your purchase of EViews 12, 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

Installing

To begin installation, simply click on the "EViews12Installer(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. You should have been provided with a 24-character serial number as part of your purchase. 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 12 to override the existing registration. Registering the extensions is not required, but doing so 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 12 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 12 on a specific computer, you must first register the program using the serial number obtained with your purchase or obtained from your license administrator.provided with this guide or your textbook bundle. 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.

Under the terms of the EViews Volume License agreement, "12C" (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.

The copy of EViews may be uninstalled and reinstalled on a registered machine, updated, or moved to a different directory without re-registering 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 re-register 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 re-registering.

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.

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.

On a Windows machine, 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 the these two options will open a dialog prompting you for additional information.

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.

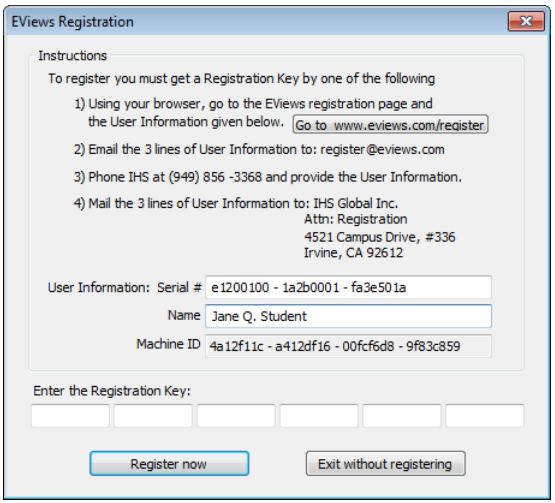
Note that there are some circumstances in which auto registration will fail. Obviously, auto registration will not work if the computer is not connected to the Internet. If registration fails, you should first verify that you have Internet access. Second, your computer may be behind a firewall which 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
3030 Old Ranch Parkway, Suite 260
Seal Beach, CA 90740
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 re-register 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.

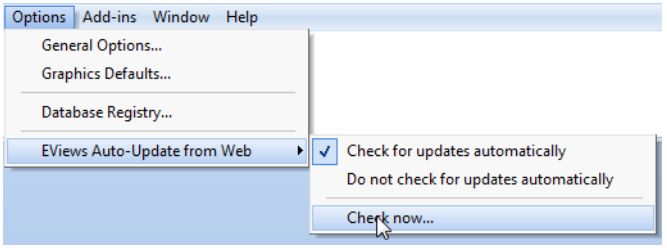
- *What if I have trouble registering?*

  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 12 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. You may also access the EViews documentation online at

http://www.eviews.com/help/helpintro.html

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

New Features in EViews 12

EViews 12 features a number of exciting changes and improvements. The following is an overview of the most important new features in Version 12.

Note that in some cases, entries will appear in more than one section as they might otherwise be overlooked by those who may find them of interest.

General EViews Interface

- All new JSON-based workfile format ("New Workfile Format," on page 11).
- Table export to Markdown Format ("Table Export to Markdown Format" on page 13).

Data Handling

- DBnomics support ("DBnomics," on page 14).
- U.S. Energy Information Administration support ("U.S. Energy Information Administration (EIA)," on page 20).
- IHSMarkit support ("IHS Markit," on page 28).
- OECD SDMX support ("OECD SDMX (Organisation for Economic Cooperation and Development Statistical Data and Metadata eXchange)," on page 35).
- All new JSON-based EViews workfile format ("New Workfile Format," on page 11).

Graphs

- Animated graphs ("Animated Graphs" on page 38).
- XY Error Bar graphs ("XY Error Bar Graphs" on page 40).
- Sample-based line and shade placement ("Sample Line and Shade Placement" on page 42).

Econometrics and Statistics

Estimation and Analysis

- Regression Variable Selection using GETS and Lasso ("Regression Variable Selection" on page 43).
- Indicator saturation testing for outliers and structural breaks in a regression specification ("Indicator Saturation" on page 44).
- Improved MIDAS Mixed Frequency Regression ("Mixed-Frequency Regression" on page 45).

- Fractionally Integrated GARCH and EGARCH estimation ("FI(E)GARCH" on page 46).
- New evaluation tools for all GARCH models ("News Impact, Stability Tests, Sign Bias Misspecification Tests" on page 47).
- Enhanced Elastic Net and Lasso tools ("Elastic Net and Lasso" on page 50).
- Improved VAR impulse response user interface ("Impulse Response User Interface" on page 51).
- Bootstrap impulse response confidence intervals for VARs and VECs ("Bootstrap Impulse Response Confidence Intervals" on page 52).
- Two-way cluster robust standard errors in panel and pool settings ("Panel and Pool Two-way Cluster Robust Covariances" on page 53).
- Enhanced tools for estimating and analyzing functional coefficients models ("Functional Coefficients Models" on page 55).

Testing and Diagnostics

- Correlated (second generation) panel unit root tests (PANIC and CIPS) ("Cross-Sectionally Dependent Panel Unit Root Tests" on page 58).
- Wavelet decomposition of a series: discrete transform, outlier detection, decomposition of variance, thresholding ("Wavelet Decomposition," on page 60).
- New number of factor selection methods for principal components and factor analysis ("Number of Factor Selection Methods" on page 63).

Models

- Solving control to meet target ("Solve Control for Target," on page 64).
- Endogenous variables specification ("Endogenous Variable Specification," on page 66).

Command Language

- New object data members ("Object Data Members," on page 68).
- List of new or updated global commands ("Updated Command List" on page 69).
- List of new or updated object commands ("Updated Object List" on page 69).

EViews 12 Compatibility Notes

- Compatibility notes for users of EViews 11 and earlier ("EViews 12 Compatibility Notes" on page 72).

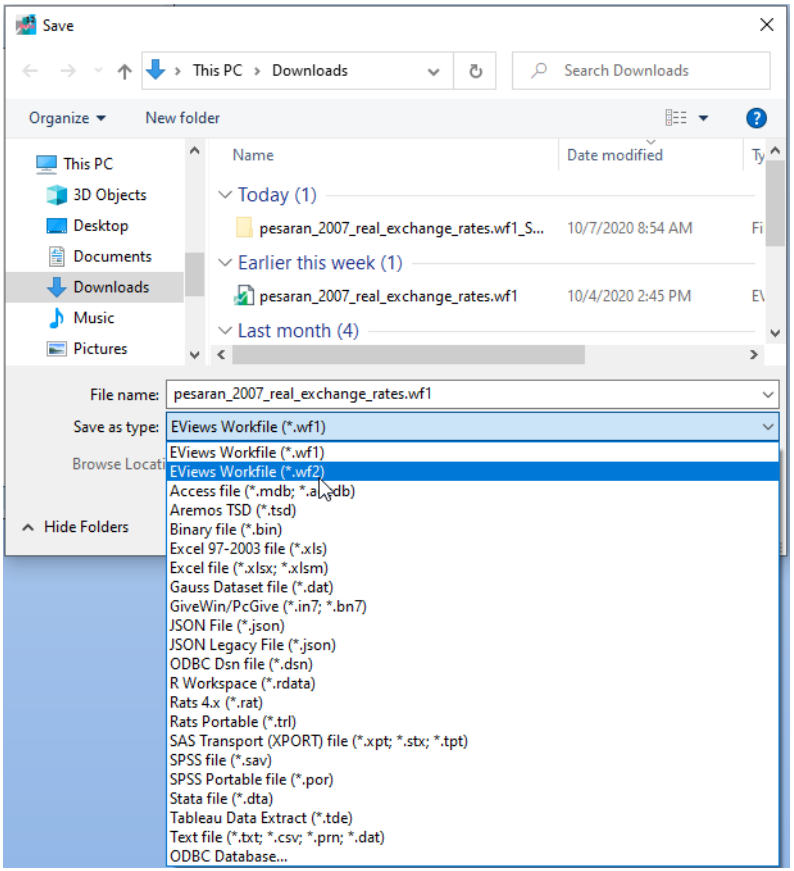
General EViews Interface

New Workfile Format

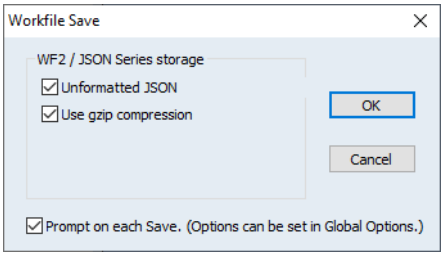
EViews 12 now supports a new workfile file format (".WF2"). This new format is text-based (using JSON) which means it can be opened using any simple text editor to view all workfile data elements.

By default, the new WF2 format will generate unformatted JSON (no carriage returns or tabs) and the file will also be compressed using GZIP to minimize disk usage. You can optionally turn these settings off in order to save a text file that is formatted, uncompressed, and easily readable.

You can save your workfile as a WF2 file by clicking on **File/Save As...,** then select **EViews Workfile (*.wf2)** in the **Save as type** drop down:

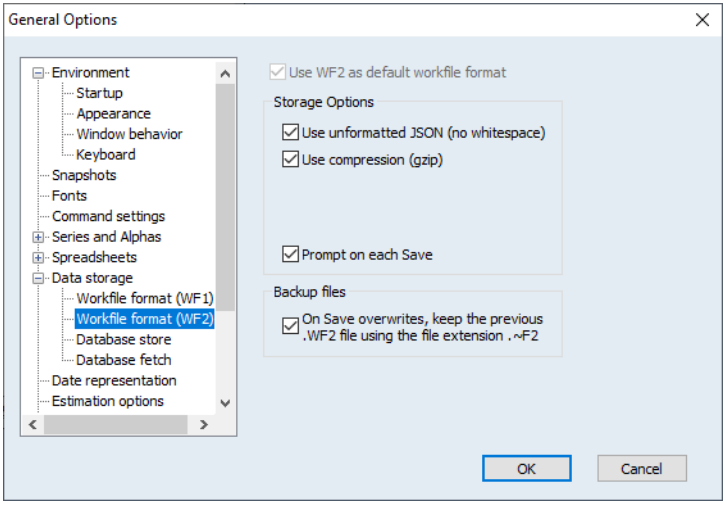


EViews will display a **Workfile Save** dialog with options that allow you to override the default settings:



Here, the new workfile save will generate unformatted JSON (no carriage returns or tabs) and the file will be compressed. Click on **OK** to save the file.

To choose WF2 as your new default format, go to Options menu/General Options/Data Storage/Workfile format (WF2) and check the **Use WF2 as default workfile format** checkbox:



To save your workfile in the new WF2 format using a command, specify a filename extension of ".WF2",

```
wfsave mywork.wf2
```

or specify the wf2 type option in the command

```
wfsave(type=wf2) mywork
```

This new WF2 format supports the following save options:

- `nojf` – Saves JSON without any unneeded text formatting (such as spaces, tabs, carriage returns). Reduces disk usage.

- `jf` – Saves JSON with all text formatting required to make it easy to read.
- `gzip` – Saves JSON file as a compressed gzip file. Reduces disk usage.
- `nogzip` – Saves JSON file as a simple text file without any compression.

The older JSON format that previous versions of EViews supported can be replicated by using a new "type = jsonlegacy" option

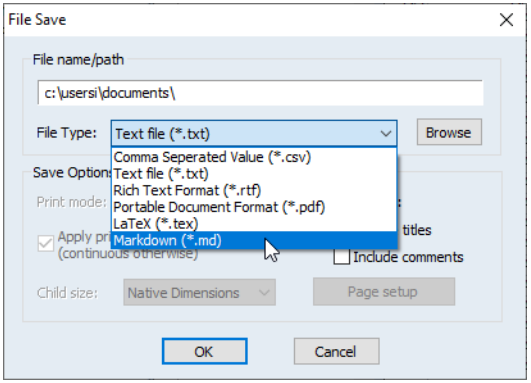
```
wfsave(type=jsonlegacy) output
```

See `pagesave` (p. 458) and `wfsave` (p. 555) in the *Command and Programming Reference* for updated command documentation.

Table Export to Markdown Format

EViews 12 has extended the printing capabilities of EViews with Markdown. Tables, graphs, and other output objects can now be formatted with the basic features of this simple, easy-to-read markup language.

To save your EViews output as Markdown, simply display the output, right-click and select **Save to Disk**. EViews will display a **File Save** dialog.



Use the **File type** dropdown to select **Markdown**, enter or navigate to the desired path, and provide a filename and click on **OK**.

See `save` (p. 489) in the *Command and Programming Reference* and `Table::save` (p. 941) and `Text::save` (p. 969) in the *Object Reference* for command documentation.

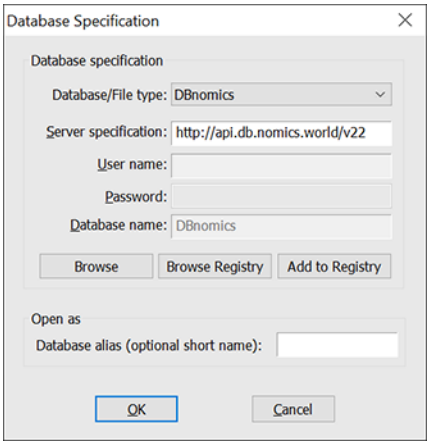
Data Handling

EViews 12 features new support for several different data sources.

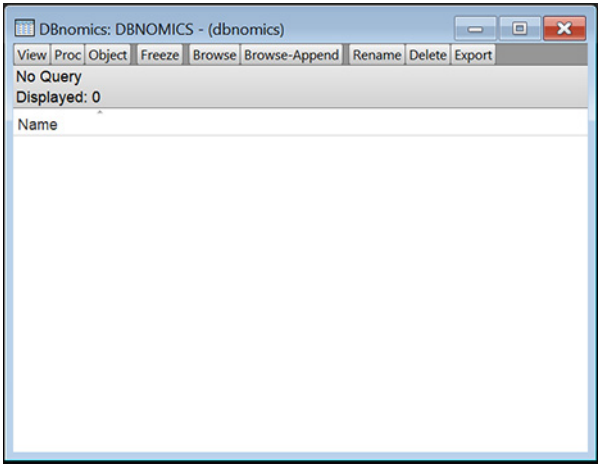
DBnomics

DBnomics provides access to a large range of publicly available economic data from national and international institutions like the IMF, Eurostat, World Bank, ECB, *etc.* Please note that an internet connection will be required to obtain DBnomics online data. For more information on the datasets, please see http://db.nomics.world.

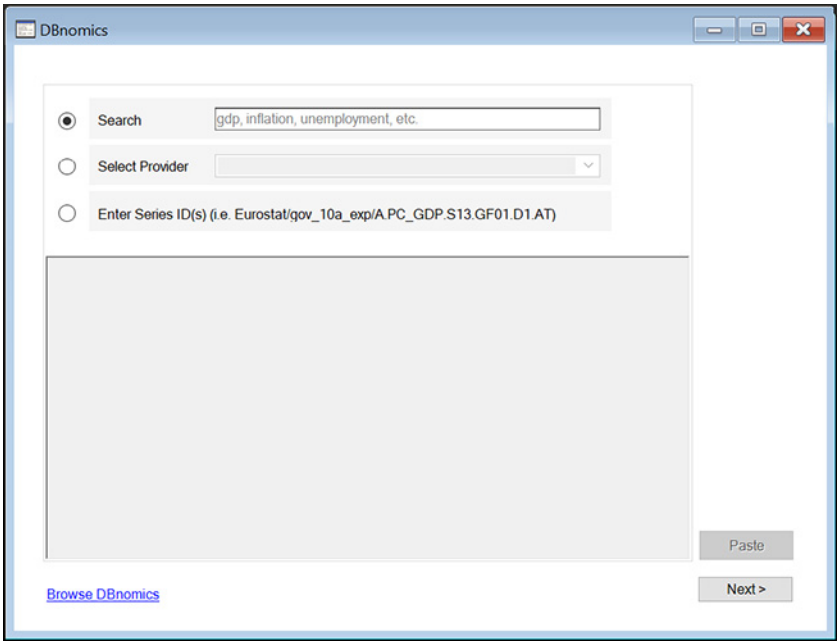
EViews offers a custom interface to the DBnomics data. To open the DBnomics database, select **File/Open Database…** from the main EViews menu, then select DBnomics from the **Database/File type** dropdown menu:



When you click on **OK**, EViews will open a standard database window:

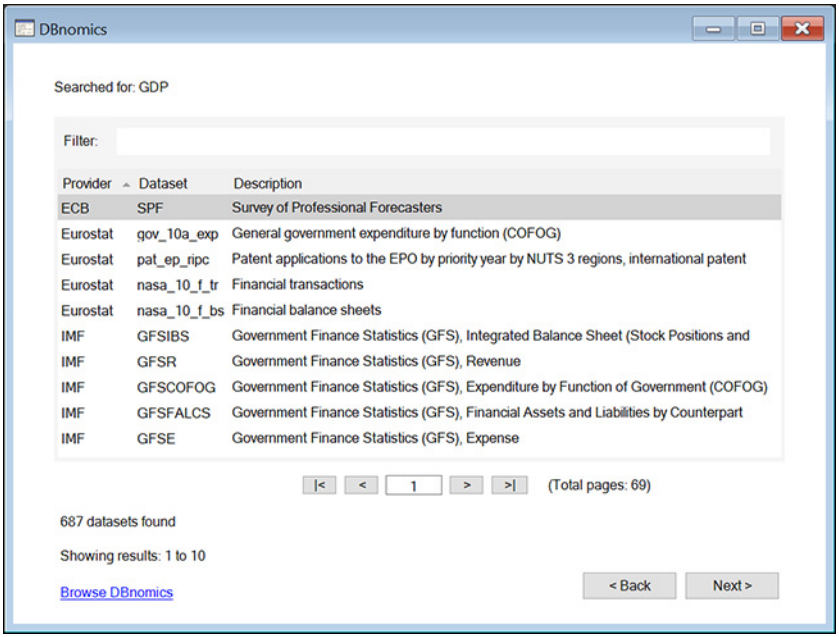


Click on **Browse** to open the custom DBnomics window:



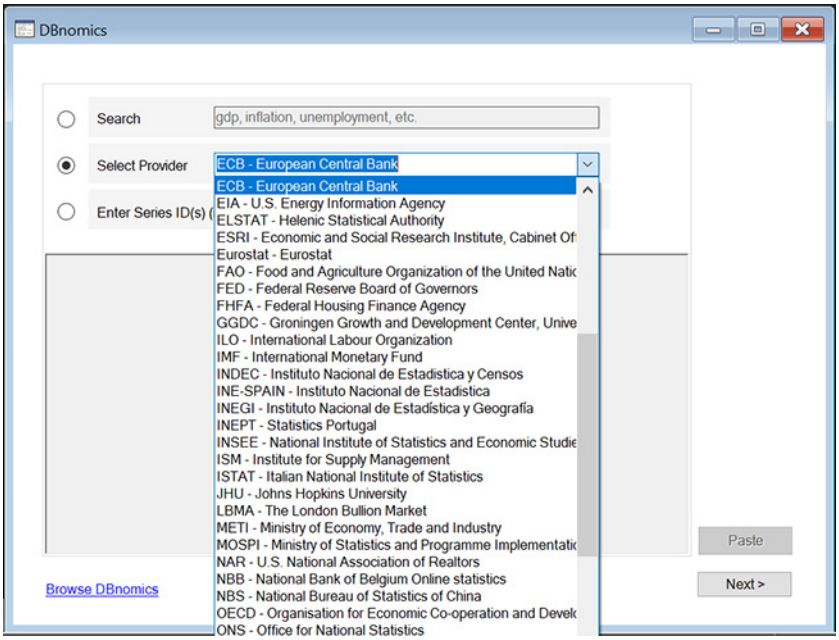
The dialog interface allows you to continue your search for data by searching for a keyword, by selecting a provider, or by typing known series ids.

There are three methods to find the data you want. To search directly, click the **Search** radio button and type a keyword in the textbox. Use the **Next** button to view the results of the search:

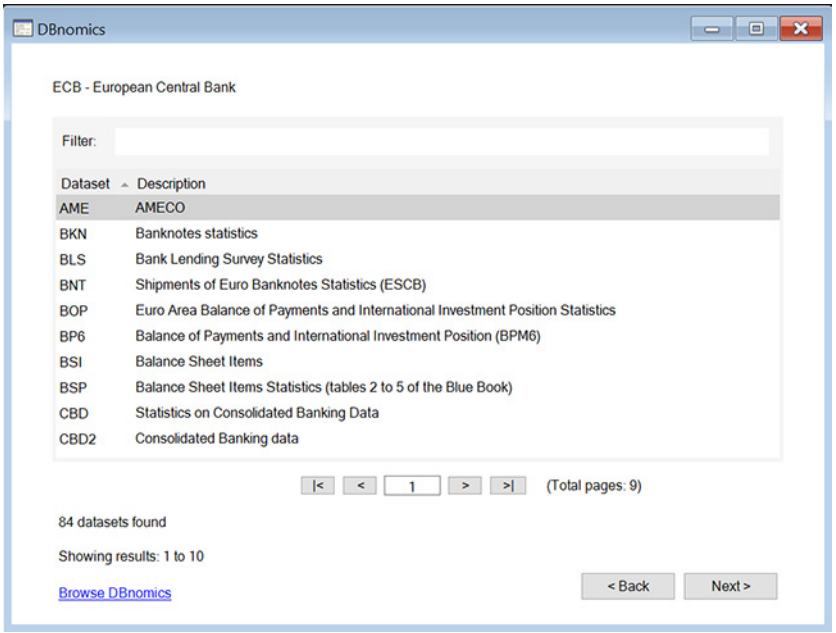


EViews will display a dialog that contains a table with all providers and datasets related to the keyword searched (GDP in this case). The interface provides a way to filter through the results by typing a keyword in the **Filter** textbox. It also provides a textbox and buttons to navigate through pages of results. Click the **Next** button or double-click on a row to select a provider and a dataset.

To select by data provider, click the radio button **Select Provider** and choose one of the entries listed in the drop-down box:

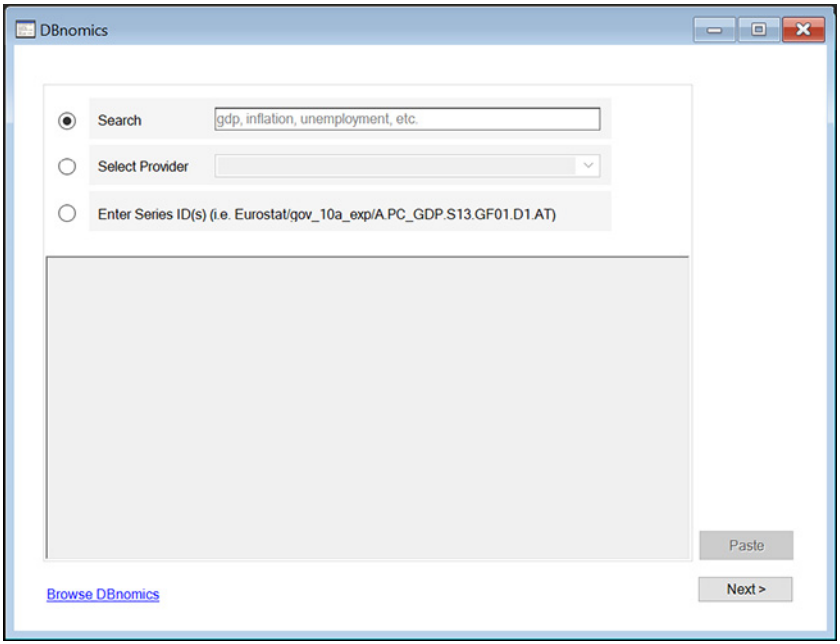


Use the **Next** button to view the results in a dialog that contains a table with all datasets related to the specified provider (in this case, ECB):



The interface provides a way to filter through the results by typing a keyword in the **Filter** textbox. It also provides a textbox and buttons to navigate through multiple pages of results. Click the **Next** button or double-click on a row to select a dataset.

The **Search** and **Select Provider** options will display a dialog where the user can view and select series:

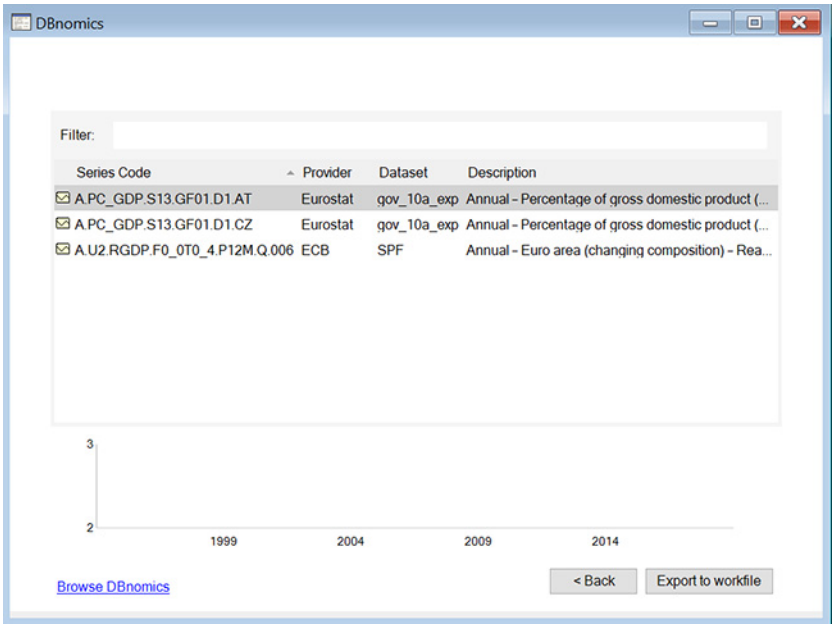


This dialog contains a table where all the series matching the search are displayed. The interface provides a textbox where search criteria can be viewed or changed. It also provides a list of dropdown boxes that contain additional search filter criteria. By clicking a filter drop box one or more options can be selected. After selections are made the results of series will be updated to match the filter options. The interface also provides a graph preview of the data selected.

Once you have found and selected the series of interest, you may drag-and-drop or click the **Export to workfile** button to export the series directly into an existing or new EViews workfile.

The third option is to enter a Series ID. Click the radio button **Enter Series ID(s)** and enter one or more series codes in the text area:

Use the **Next** button to view the series:



The resulting dialog contains a table with all the series is displayed. The interface provides a way to filter through the results by typing a keyword in the **Filter** textbox. It also provides a graph preview of the series data selected.

Once you have found and selected the series of interest, you may drag-and-drop or click the **Export to workfile** button to export the series directly into an existing or new EViews workfile.

For additional detail, see

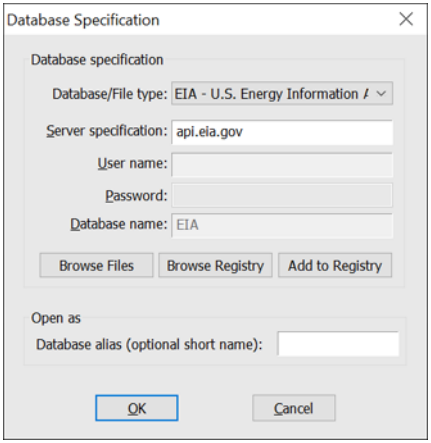
- "Foreign Format Databases" on page 353 in *User's Guide I*.
- See also `dbopen` (p. 350) in the *Command and Programming Reference*.

U.S. Energy Information Administration (EIA)

The EIA database is a large collection of free and publicly available energy and related economic data provided by the U.S. Energy Information Administration. EViews Enterprise Edition supports both online access to EIA data via the EIA web server and offline access to data downloaded in the EIA Bulk File format.

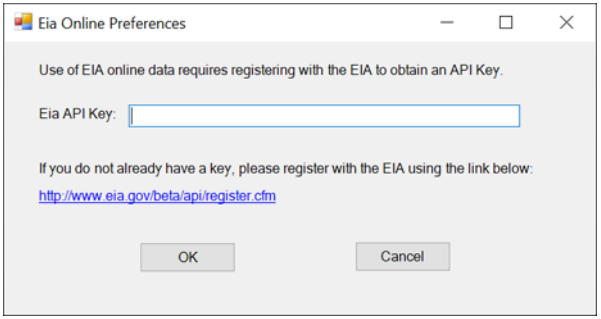
Online EIA Database

To open the EIA online database, simply select **File/Open Database…** from the main EViews menu, then select **EIA - U.S. Energy Information Administration** from the **Database/File type** dropdown menu:



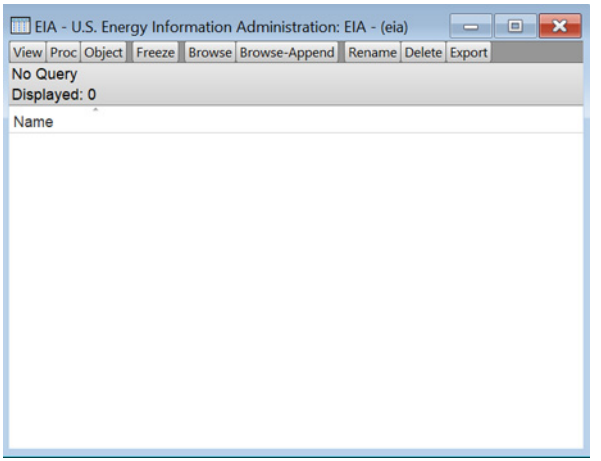
The server specification will be automatically filled in with the EIA server address api.eia.gov. This does not need to be changed. Click on **OK** to proceed.

Use of the EIA online service is free but requires registration. The first time you attempt to open the EIA online database you will be asked to enter an API Key obtained from the EIA:

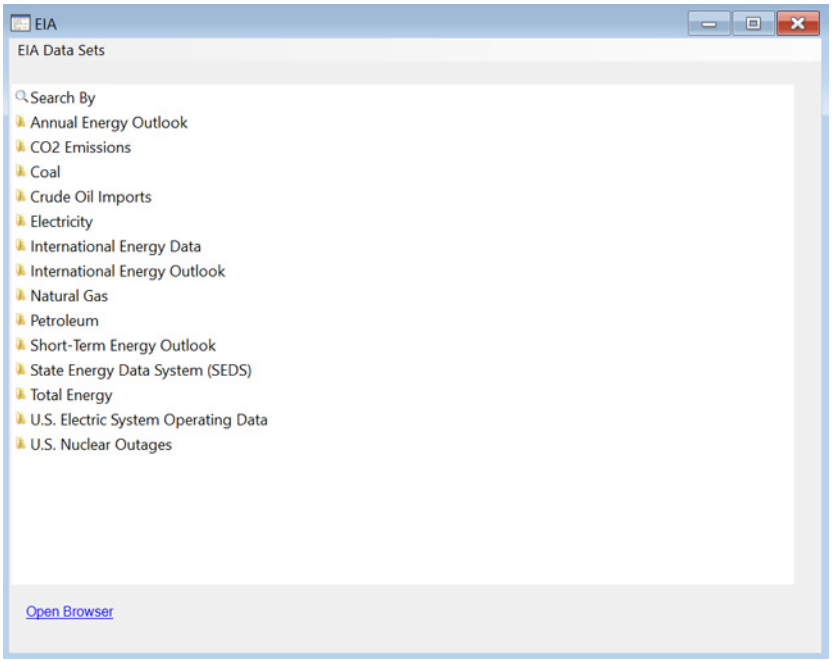


Please enter your API key and click on **OK**. The key will be saved as a user specific setting in your EViews ".ini" file. If you need to change the key at a later time, use **View/Preferences…** from the EViews database menu to bring up the dialog again so you can modify your settings.

When you click on **OK**, EViews will open a standard database window:

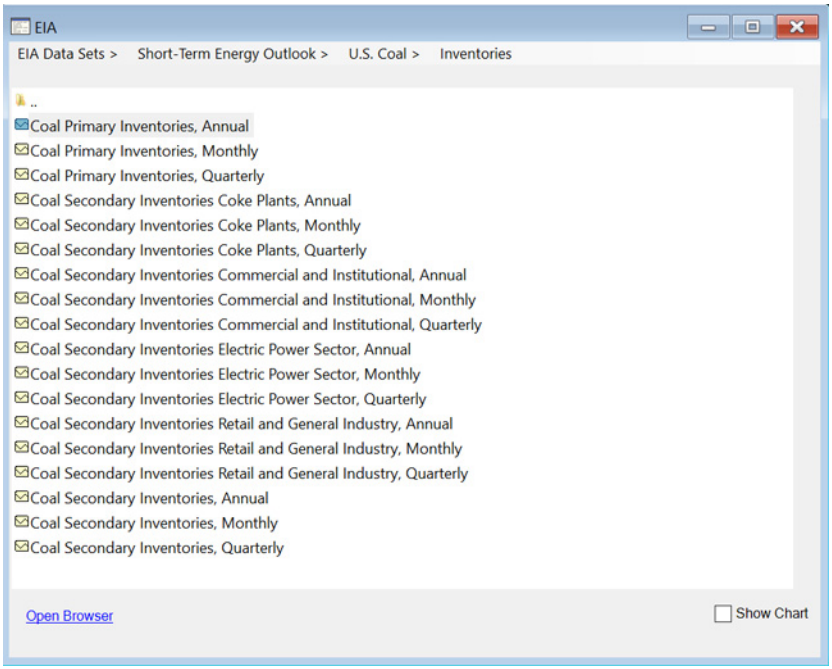


The EIA database connection supports a custom browser window for navigating through the EIA data. Click on **Browse** to open the custom browser window. The standard database window will be minimized and the EIA browser window will open:



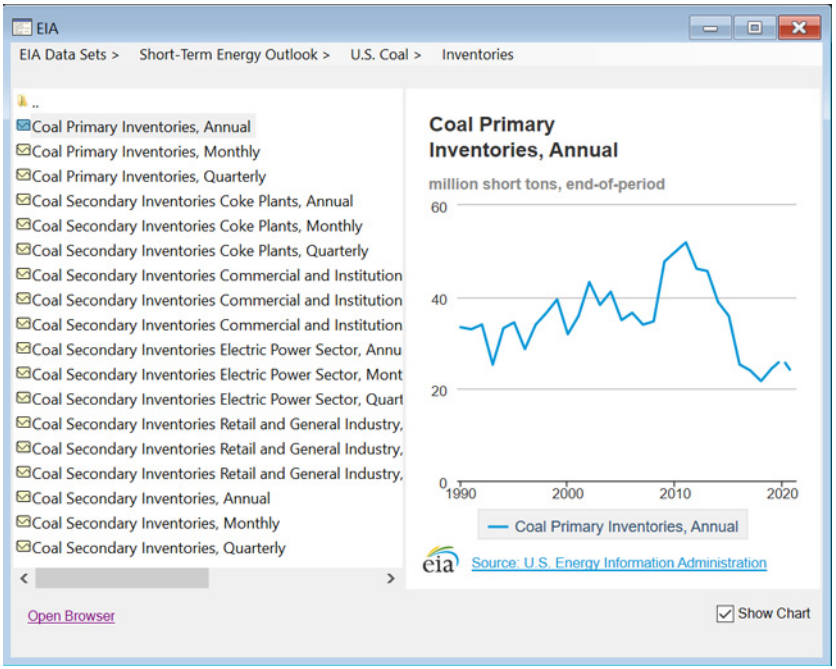
The browser window displays a **Search By** link and the data sets available within the database as a set of folders, where each folder may contain additional folders or a list of series

available for download. Clicking on a folder moves you into that folder and adds the folder to the path displayed at the top of the window:



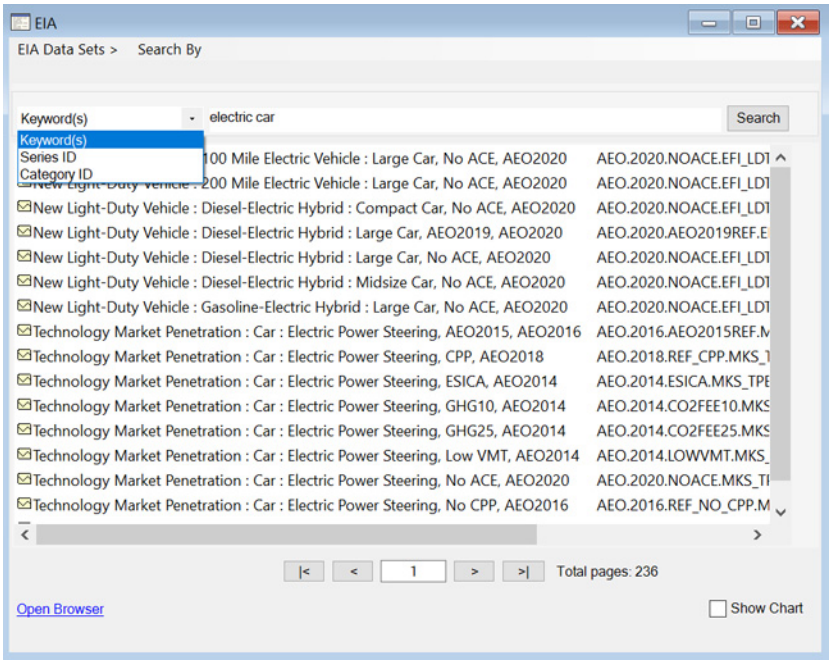
You can return to the previous folder by clicking on the ".." folder icon at the top of the list, or move directly to any folder within the current path by clicking on the path component at the top of the window.

Select the **Show Chart** box to view a chart of a selected series:

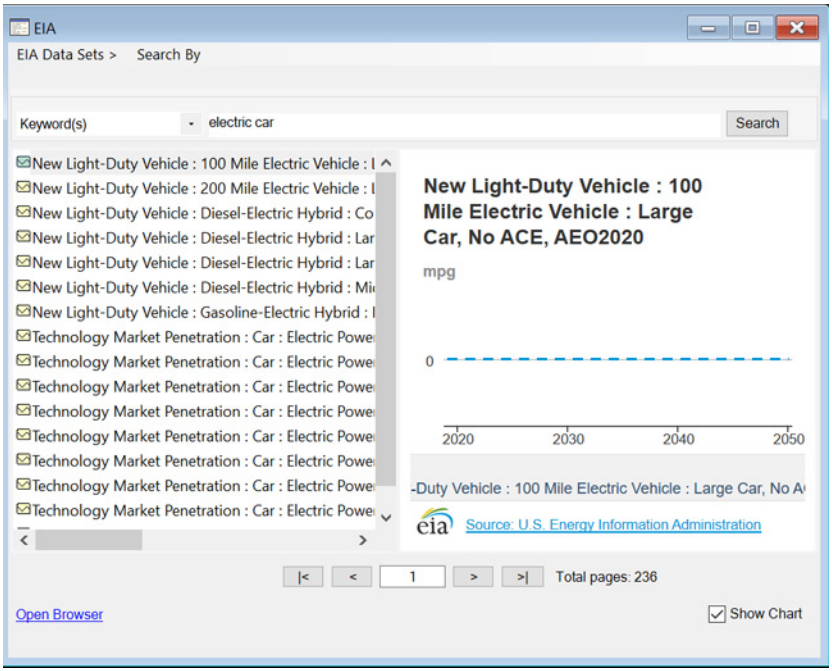


All the dialogs contain a link (**Open Browser**) to the API. Click on the link to get additional information including documentation.

Additionally, the EIA Edx allows the user to search for one or multiple series. Click on the **Search By** link to search for series by Keyword(s), Series ID, or Category ID.



You can select the **Show Chart** box to view the chart of a selected series:

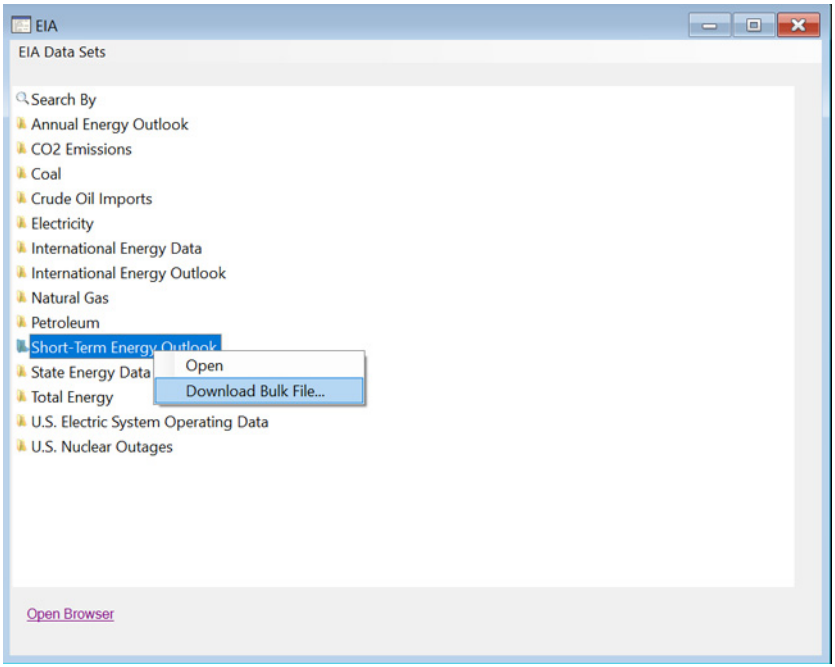


Once you have found and selected the series of interest, you may drag-and-drop or copy-and-paste the series directly into an EViews workfile. When you have finished working with the browser, simply close the browser window to restore the regular EViews database window.

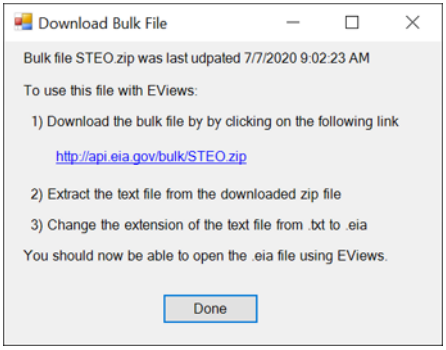
Offline EIA Bulk File - U.S. Energy Information Administration Databases

EViews also allows you to work offline with data downloaded from the EIA using the EIA bulk download facility. The bulk download feature allows you to fetch all series and category information from an entire EIA data set into a single local file. Downloading an entire bulk file is generally much more efficient than fetching a large number of series one at a time. Once the file has been downloaded, you can navigate within the dataset and bring data into EViews without reconnecting to the EIA servers.

To download a bulk file, open the browser window of the EIA online database, right click on a data set, then select **Download Bulk File…**:



A dialog will appear giving instructions for downloading the file and preparing it for use by EViews:

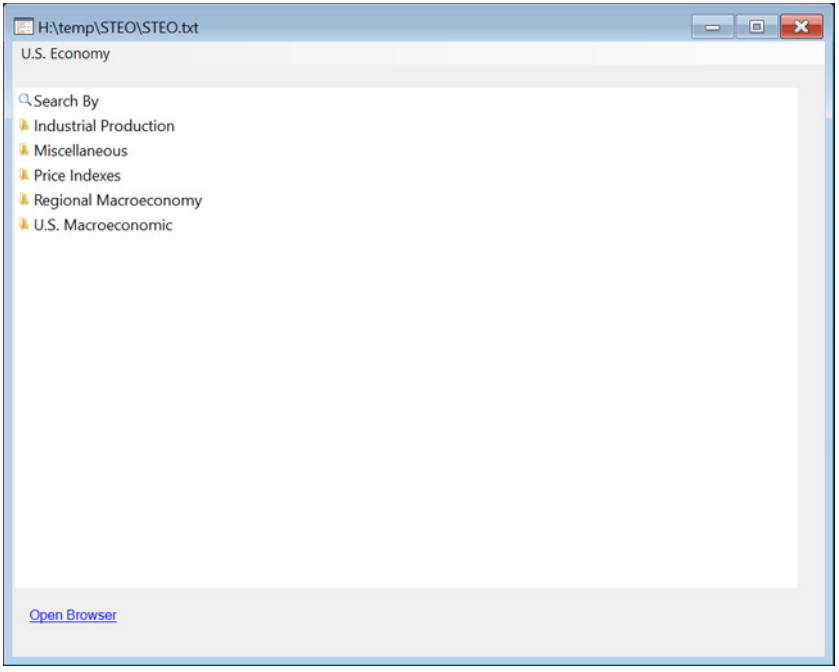


Clicking on the download link will open your default web browser and start a download of the file. The bulk file is compressed in ".zip" format. You will need to use an unzipping utility to extract the single ".txt" file contained within the zip file.

Once the bulk file is ready, use **File/Open Database…** to browse to the file and click **OK** to open it:

Alternatively, you can drag and drop the file onto EViews to open it. First, however, you should rename the ".txt" file to ".eia" so EViews can tell that the file contains data in EIA bulk file format and is not a generic text file.

The caption on the window indicates that you are working with a local file. Otherwise, the interface behaves the same as when working with online data:



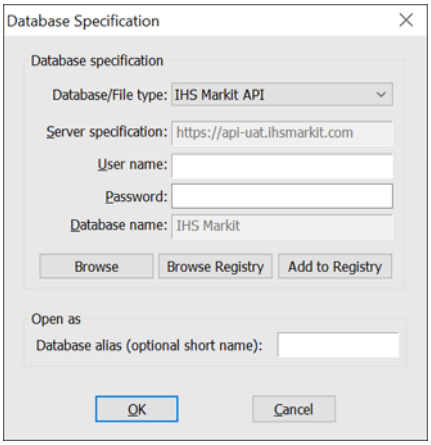
Note that some EIA datasets are large, potentially hundreds of megabytes of uncompressed data. When working with large files you may see a delay as the file is opened since EViews must scan the entire bulk file to find all series and category information stored in the file. Subsequent operations should be fast since all data is stored locally on your machine.

- "Foreign Format Databases" on page 353 in *User's Guide I*.
- See also `dbopen` (p. 350) in the *Command and Programming Reference*.

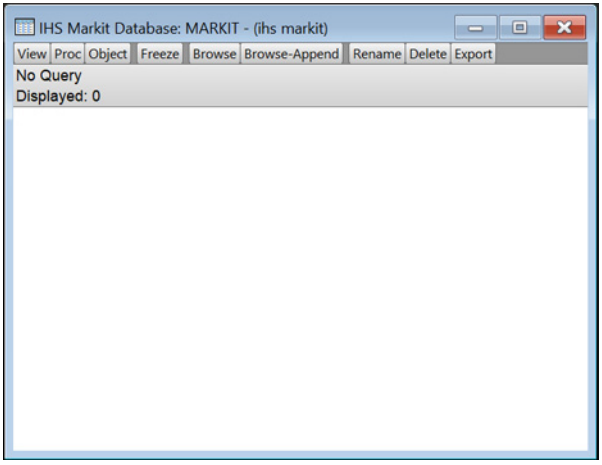
IHS Markit

IHS Markit provides access to financial data from a large number of datasets. To access IHS Markit data from EViews, you must have a currently active account to the IHS Markit data API and be able to log into it on your machine. In addition, IHS Markit connectivity requires the EViews Enterprise Edition.

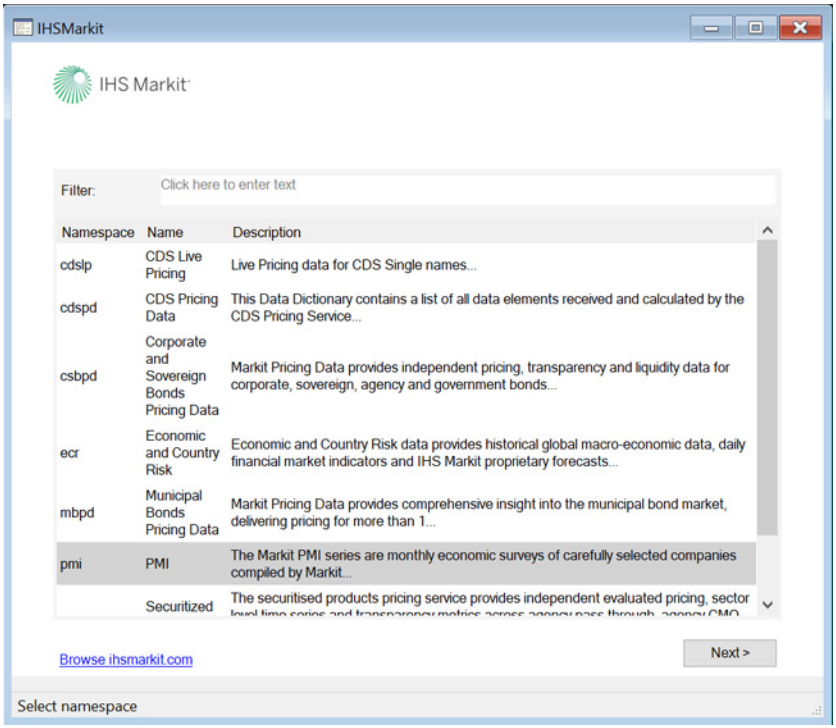
EViews offers a custom interface to IHS Markit data. To open the database, select **File/Open Database…** from the main EViews menu, then select IHS Markit from the **Database/File type** dropdown menu:



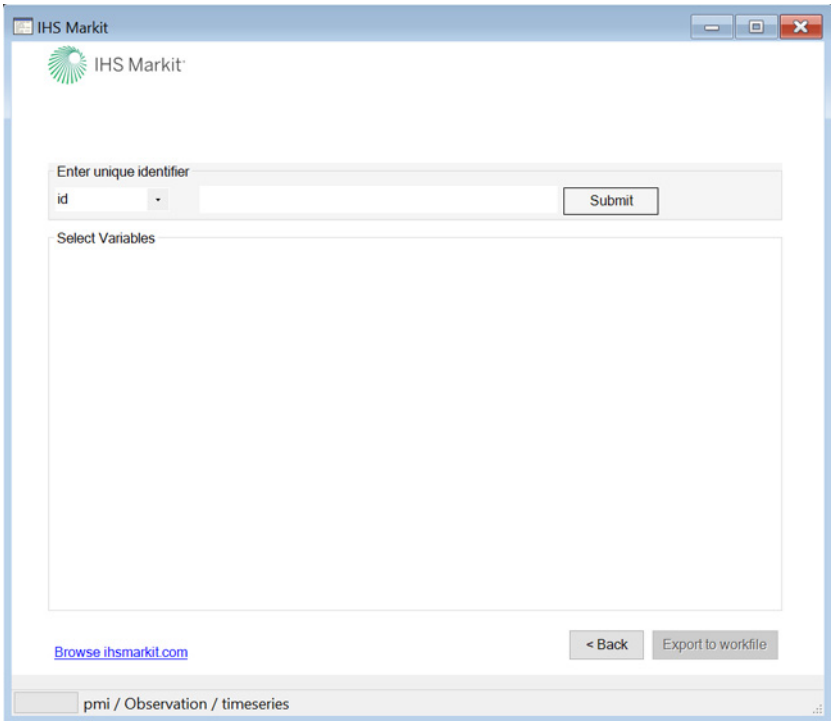
You are required to enter **Username** and **Password** information before you click on **OK**. EViews will verify your user information and open a standard database window:



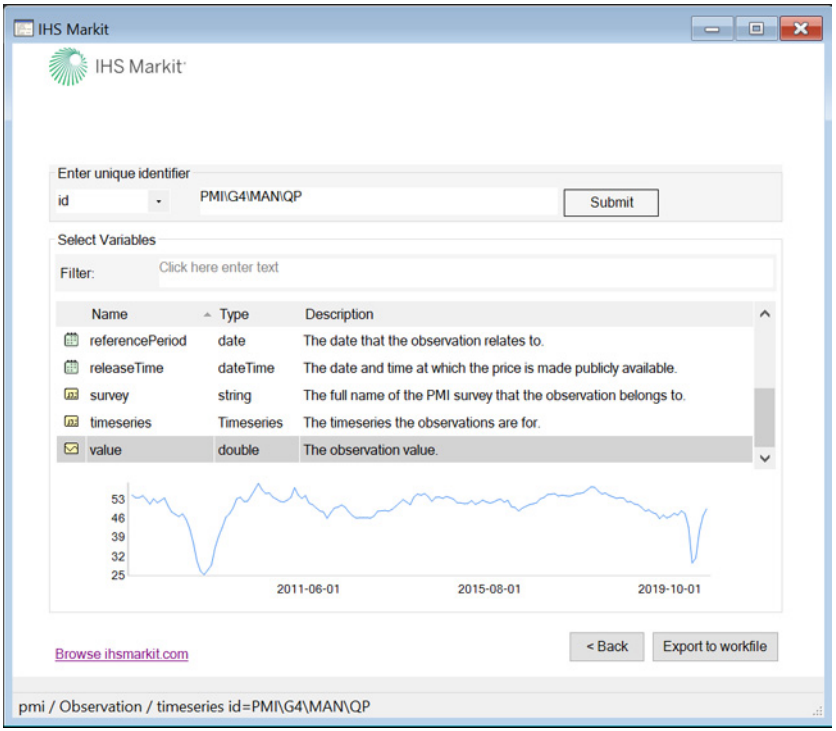
Click on **Browse** to open the custom IHS Markit window:



The dialog allows you to select data available within datasets using the **Namespace** field. You may also search through the datasets by typing a keyword in the **Filter** textbox. For this example, select a dataset and click the **Next** button:

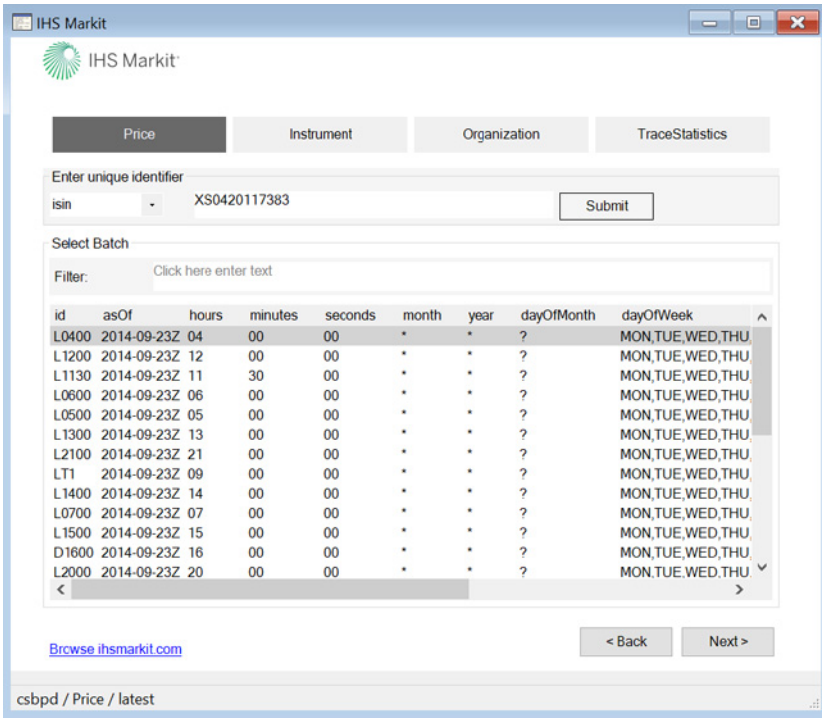


Select the type of identifier (id, cusip, isin, etc.) you want to use in the drop-down box. Type or paste a unique id and click the **Submit** button:



The dialog interface will display the list of variable names, their types, and a description. Type a keyword in the **Filter** textbox to filter the results. The interface also provides a graph preview of the series data selected. Once you have found and selected the series of interest, you may drag-and-drop or click the **Export to workfile** button to export the series directly into a new or preexisting EViews workfile.

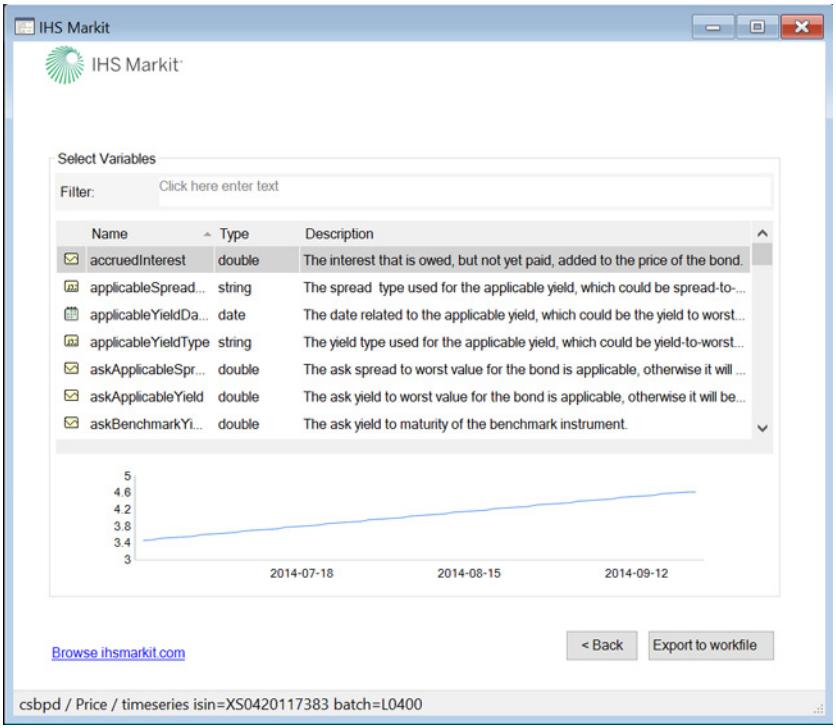
Pricing data in several datasets is organized into batches:



When batch information is available, after a unique id is entered the results table will show a list of batch-ids and metadata information. Type a keyword in the **Filter** textbox to filter the results.

Note that in the example shown in the dialog above, there are four tabs/buttons (Price, Instrument, Organization, TraceStatistics). The IHS Markit API identifies these as **Entities** and they represent additional categories with uniquely identified records. In the above example we have selected **Price** (the Entity Price defines the price, yield, spreads and other metrics of an instrument.).

Select a batch id and click the **Next** button:



The dialog interface will display the list of variable names, types, and descriptions. Type a keyword in the **Filter** textbox to filter the results. The interface also provides a graph preview of the series data selected. Once you have found and selected the series of interest, you may drag-and-drop or click the **Export to workfile** button to export the series directly into a new or preexisting EViews workfile.

All of the IHS Markit Edx dialogs contain a link (Browse ihsmarkit.com) to the API. Click on the link to get additional information, including documentation.

For additional discussion, see

- "Foreign Format Databases" on page 353 in *User's Guide I*.
- See also `dbopen` (p. 350) in the *Command and Programming Reference*.

OECD SDMX (Organisation for Economic Cooperation and Development Statistical Data and Metadata eXchange)

Eurostat, ECB, UN, IMF, and OECD

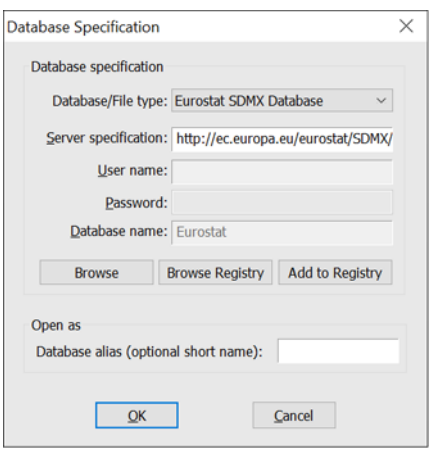
SDMX Databases provide access to a list of datasets that offer a large range of publicly available data.

Both the Standard and Enterprise versions of EViews offer access to Eurostat, ECB (European Central Bank), UN (United Nations), IMF (International Monetary Fund), and OECD (Organisation for Economic Cooperation and Development) data using SDMX Web Services.

Please note that an internet connection will be required to obtain SDMX online data. For more information on the datasets, please see

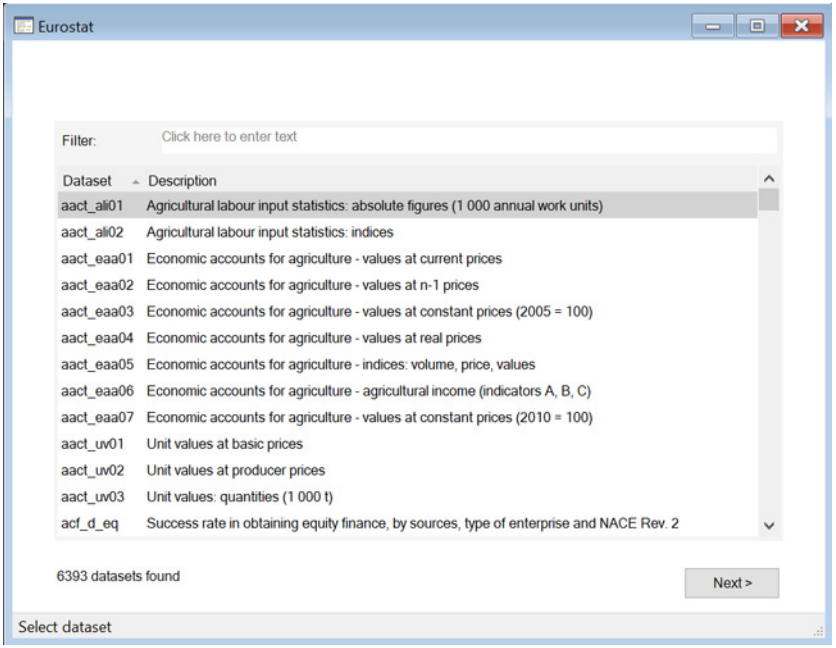
http://ec.europa.eu/eurostat/data/database
https://ec.sdw-wsrest.ecb.europa.eu
http://data.un.org/WS/
http://sdmxcentral.imf.org
http://stats.oecd.org/restsdmx/sdmx.ashx

EViews offers a custom interface to the SDMX databases. The interface includes a custom browser for navigating and retrieval of available data. To start, you must open a database window to SDMX database by selecting **File/Open Database…** from the main EViews menus, then selecting **Eurostat SDMX Database**, **ECB SDMX Database**, **UN SDMX Database, IMF SDMX Database**, or **OECD SDMX Database** from the **Database/File type** dropdown menu. A dialog similar to the one below will be displayed:

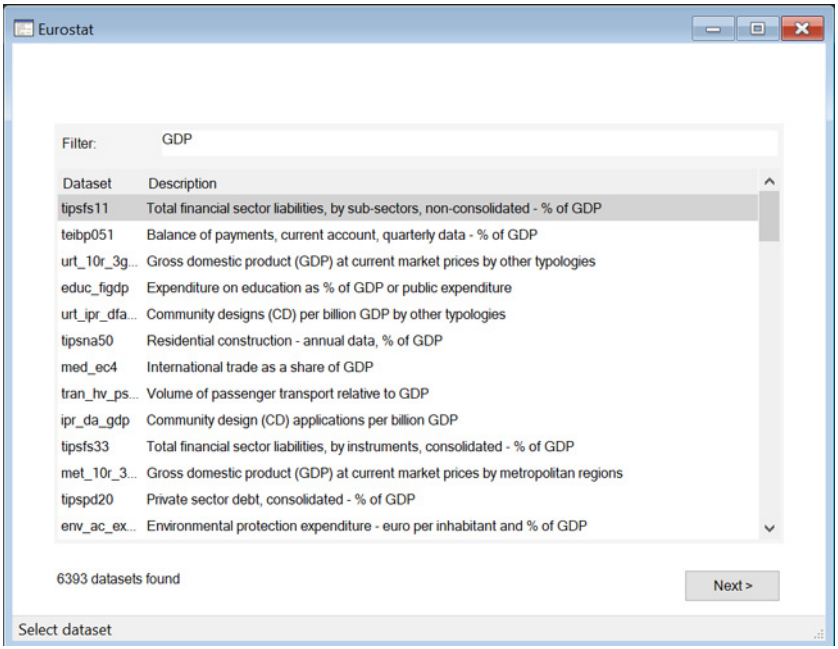


Click **OK** to open the online database. You will be presented with a standard EViews database representing a connection to data. Click on **Browse** or **Browse-Append** to open a custom database.

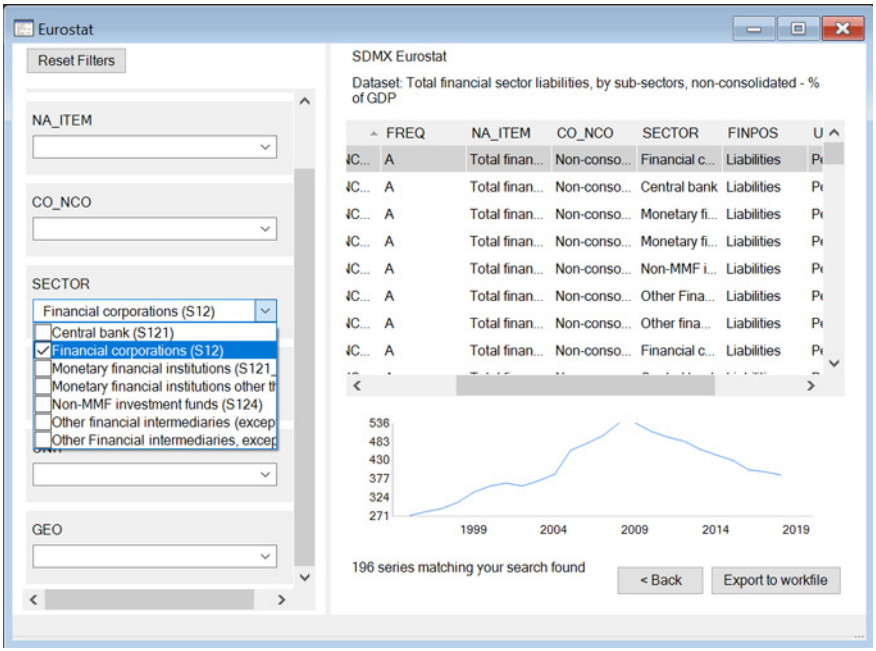
Here we see the interface to the Eurostat data:



The dialog allows you to select data available within datasets. The browser interface to the data provides a way to search through the datasets by typing a keyword in the **Filter** text-box:



Select a dataset and click the **Next >** button to display a dialog where you can view and select series:



The dialog contains a table with all series matching the search. The interface provides a list of dropdown boxes that contain additional search filter criteria. Clicking a filter drop box, a user can select one or more options. When selection is finished the results of series will be updated to match the filter options.

The interface also provides a graph preview of the series data selected.

Once you have found and selected the series of interest, you may drag-and-drop or click the **Export to workfile** button to export the series directly into an EViews existing or new workfile in the usual fashion.

For additional discussion, see

- "Foreign Format Databases" on page 353 in *User's Guide I*.
- See also `dbopen` (p. 350) in the *Command and Programming Reference*.

Graphs

Animated Graphs

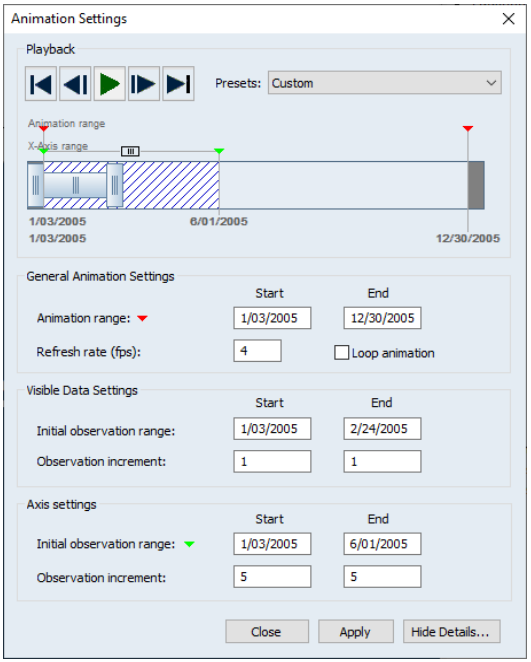
Static graphs display data for a fixed range of observations. That range may consist of a single observations or multiple observations, but it does not change.

EViews 12 introduces animated graphs, where you can dynamically adjust the range of data and thusly display how the data change over a given interval. Animated graphs allow viewers to see how data transition from period to another or alternatively compare the data between periods.

An animated graph is nothing more than multiple static graphs displayed one after another. This gives the impression of motion. To animate a graph, one of 2 things or both must change, the axis range and/or data range. When changing either the axis or data range, you must adjust one or more of the following: axis min/max and data min/max values. Additionally, you must determine by how much to adjust those value. Depending on these min/max increments used, graphs can appear to move, grow, or both.

A typical line graph of the 1-Month Treasury bond rate would appear as:

With the use of animated graphs, you can view how the bond rate changes as a function of time. To do so, press the **Animate** button in the toolbar and the animation dialog will appear. Next press the **Show Details** button.



The animation dialog is broken up into 4 main sections by which each section controls a different portion of the animation. There are sections for **Playback**, the **General Animation Settings**, **Visible Data Settings** and **Axis Settings**. The playback settings allow you to start and stop the animation, choose one of the predefined animation types, and give you a visible representation of how the graph will be animated.

For additional discussion, see

- "Animated Graphs" on page 710 in *User's Guide I*.

XY Error Bar Graphs

The XY error bar graph is an observation graph of a group containing a multiple of four series. The first series contains the x-axis points, the second series is the upper error bar, the third series is the lower error bar, and the fourth series is the data series plotted as a symbol. They are designed for displaying data with standard error bands against a non-observation based series. You may display an XY error bar graph for any group object containing four or more series.

To illustrate XY error bars, we will create a plus/minus one standard deviation confidence bands around the US unemployment rate. We will then plot this as a function of the US GDP.

Make a monthly workfile from 2017m1 to 2020m9. We can do this by issuing the command:

```
wfcreate m 2017m1 2020m9
```

Fetch the unemployment rate and GDP from the FRED database as follows:

```
dbopen(type=FRED)
fetch(m) unrate
fetch(m) gdp
close FRED
```

Transform the GDP into logs, and force the unemployment rate into a (0,1) interval by dividing by 100. This is done as follows:

```
gdp = log(gdp)
unrate = unrate/100
```

Make the lower and upper one standard confidence bounds around the unemployment rate:

```
series unrate_low = unrate - @stdev(unrate)
series unrate_high= unrate + @stdev(unrate)
```

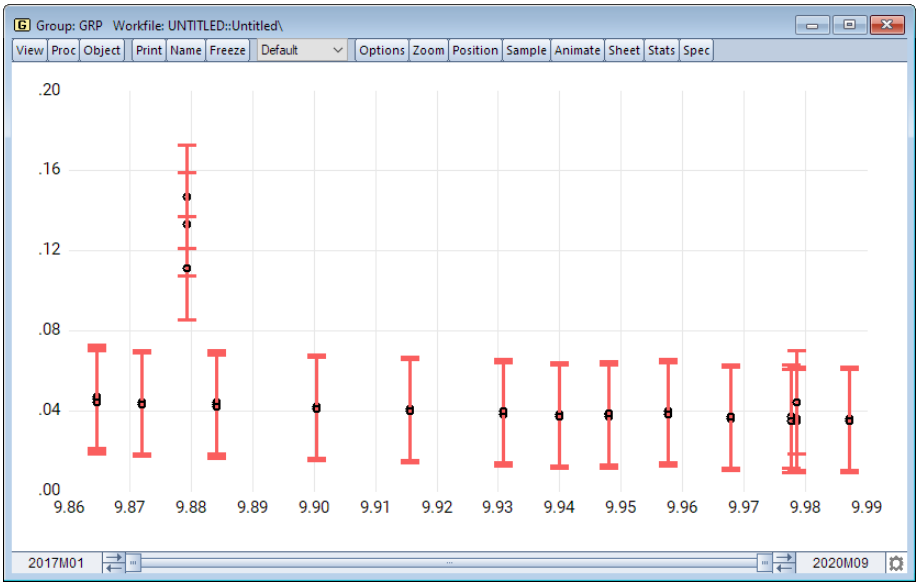
Next, create a group with the first series as the DGP, the second as the upper bound for the unemployment rate, the third as the lower bound for the unemployment rate, and the final as the unemployment rate series itself.

```
group grp gdp unrate_high unrate_low unrate
```

Finally, make the XY error bars for unemployment rate as a function of GDP. Interactively, open the group GRP, select **View/Graph...** from the group menu, and then choose **XY Error Bar** in the **Specific** list box.

By command, you may simply type

```
grp.xyerrbar
```



In contrast to the usual error bars which generate low and high values based on the observation index, the xy error bars plot the low and high values as a function of the grid populated by the unobserved series, in this case GDP.

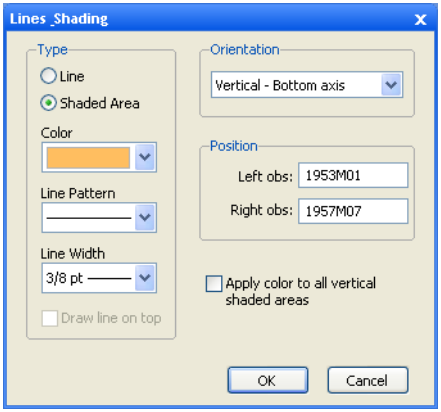
- See `xyerrbar` (p. 1142) in the *Command and Programming Reference*.

Sample Line and Shade Placement

Previously, when adding lines and shades to a frozen graph, EViews prompted you to place the new element using observation indices ("1", "10", *etc.*) or dates and date pairs.

EViews 12 adds the ability to specify placement of these elements using sample statements. This feature makes it easy to place objects at irregular elements in dated workfiles, when for example, using if conditions to highlight observations meeting a condition, say high unemployment. Similarly, you may now use predefined sample objects to place shade elements, and commonly employed intervals, when for example shading periods of recession.

You may draw lines or add a shaded area to the graph. From a graph object, click on the **Lines/Shade** button in the toolbar or select **Proc/Add shading…**. The **Lines & Shading** dialog will appear.



Select whether you want to draw a line or add a shaded area, and enter the appropriate information to position the line or shaded area horizontally or vertically. *EViews will prompt you to position either the line with an observation or data value, or the shaded area with an observation, data value, sample object or sample string.*

You should also use this dialog to choose a line pattern, width, and color for the line or shaded area, using the drop down menus.

- See `draw` (p. 325) in the *Command and Programming Reference*.

Econometrics and Statistics

EViews 12 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.

Regression Variable Selection

Variable selection, or *feature selection* as it is sometimes called in computer science literature, is an important component of modern machine learning. EViews includes three such techniques: Stepwise, and *(new to EViews 12)* Lasso and Auto-Search/GETS.

Each of these techniques are implemented in EViews as a pre-estimation step before performing a standard least squares regression. Before estimation, you must specify a dependent variable together with a list of always-included variable, and a list of selection variables, from which the selection algorithm will choose the most appropriate. Following the variable selection process, EViews reports the results of the final regression

- "Auto-Search / GETS" on page 68 in the *User's Guide II* offers an improvement of stepwise regression techniques by adding tests of model validity to the selection process.
- "Lasso" on page 69 in the *User's Guide II* outlines how the Lasso estimation technique, which is based on estimating regression where the objective penalizes complexity, may be also used as a pre-estimation tool to determine the regressors in least squares.

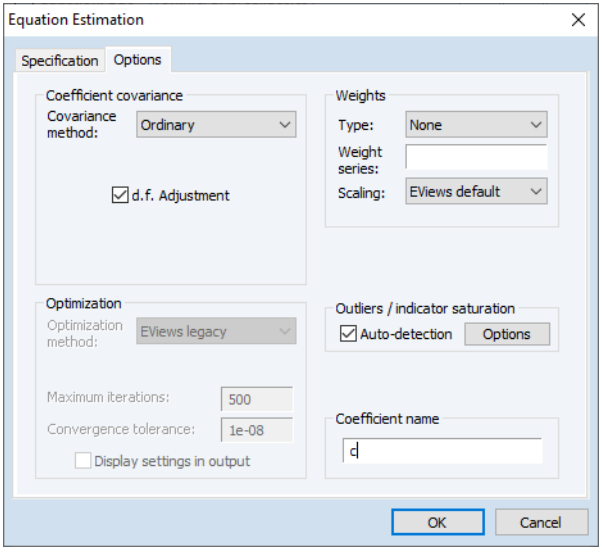
- See "Variable Selection Methods" on page 66 in the *User's Guide II* for an overview and additional detail.
- See also `Equation::varsel` (p. 208) in the *Object Reference* for command documentation.

Indicator Saturation

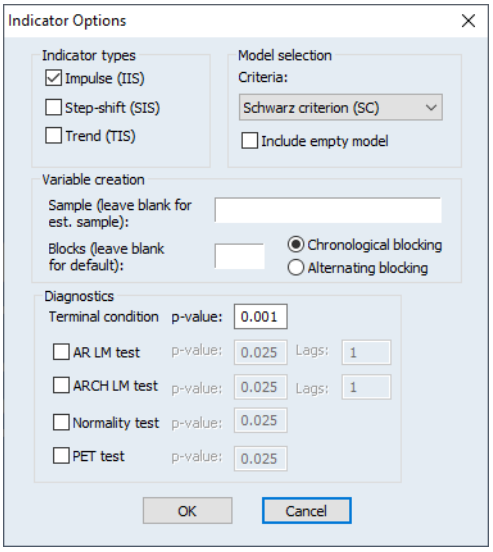
EViews 12 adds regression tools for testing outliers and structural breaks in a regression specification based on the *indicator saturation* approach.

The indicator saturation approach is an extension of least squares regression for testing for outliers and structural breaks in a regression specification. The indicator saturation approach works by including indicator variables for outliers or structural breaks at every observation in the regression, and then employing the GETS algorithms to select which of the included variables should be retained in a final regression model.

To instruct EViews to detect indicators in your least squares regression, open the equation estimation dialog, enter your least squares specification in the **Equation specification** edit field, and select **LS - Least Squares (NLS and ARMA)** in the **Method** dialog. Next, click on the **Options** tab to display the dialog:



Select the **Auto-detect** check box in the **Outlier/indicator saturation** area on the right-hand side of the dialog, and then press the **Options** tab to bring up the **Indicator Options** dialog:



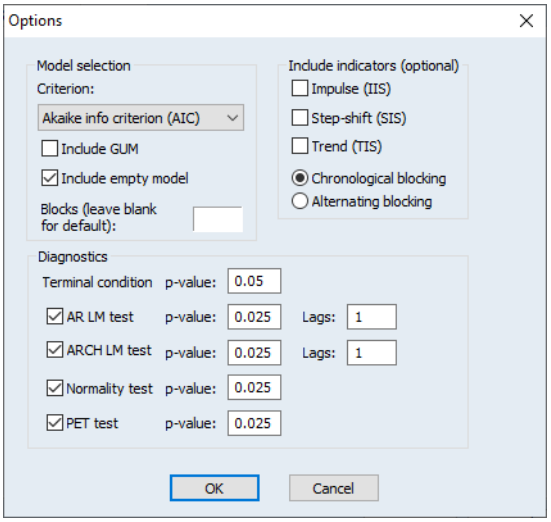
- See "Indicator Saturation" on page 60 in the *User's Guide II* for an overview and additional detail.
- See also `Equation::ls` (p. 138) in the *Object Reference* for updated command documentation.

Mixed-Frequency Regression

Mixed Data Sampling (MIDAS) regression was introduced in EViews in earlier versions. MIDAS is an estimation technique which allows for data sampled at different frequencies to be used in the same regression.

More specifically, the MIDAS methodology (Ghysels, Santa-Clara, and Valkanov, (2002) and Gyhsels, Santa-Clara, and Valkanaov (2006), and Andreou, Ghysels, and Kourtellos (2010)) addresses the situation where the dependent variable in the regression is sampled at a lower frequency than one or more of the regressors. The goal of the MIDAS approach is to incorporate the information in the higher frequency data into the lower frequency regression in a parsimonious, yet flexible fashion.

EViews 12 extends the existing MIDAS toolbox by adding additional estimation options. These new features allow you to use the General-to-Specific (GETS) method for variable selection and indicator saturation.



See Chapter 30. "Midas Regression," beginning on page 341 in the *User's Guide II* for additional discussion.

See also `Equation::midas` (p. 159) in the *Object Reference* for command documentation.

FI(E)GARCH and GARCH Tools

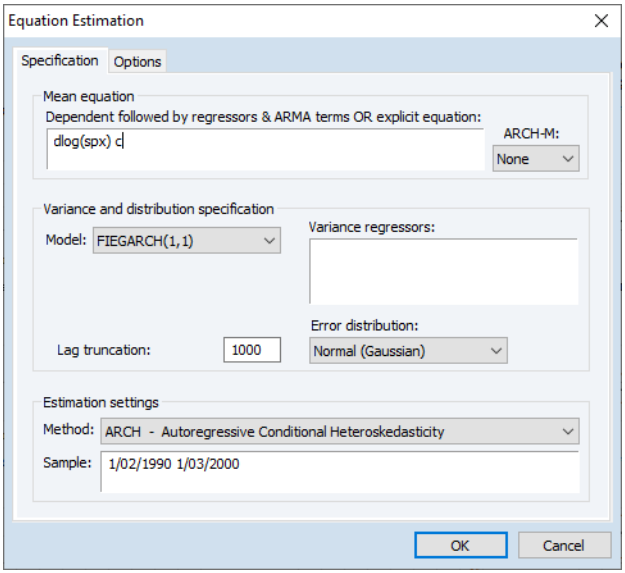
EViews 12 introduces several new tools for estimating and working with conditional variance models. These tools include new estimation methods that allow for long-memory processes, and new equation views that make it easy to examine the properties of your GARCH estimated equations:

- FIGARCH / FIEGARCH.
- News Impact, Stability Tests, Sign Bias Misspecification tests.

FI(E)GARCH

EViews 12 estimates Fractionally Integrated GARCH (FIGARCH) models, with support for both standard FIGARCH and Fractionally Integrated Exponential GARCH (FIEGARCH) specifications.

While traditional GARCH models focus on short term dynamics of conditional variance, the fractionally integrated GARCH model (FIGARCH) model, introduced by Baillie, Bollerslev and Mikkelsen (1996, BBM), is designed to capture long run dependence properties of the variance. The FIEGARCH model of Bollerslev and Mikkelsen (1996) adds FIGARCH long-memory innovations to EGARCH processes.



- See FIGARCH / FIEGARCH ("Fractionally Integrated GARCH and EGARCH" on page 281) in the *User's Guide II* for additional discussion.
- See also `Equation::arch` (p. 45) in the *Object Reference* for command documentation.

News Impact, Stability Tests, Sign Bias Misspecification Tests

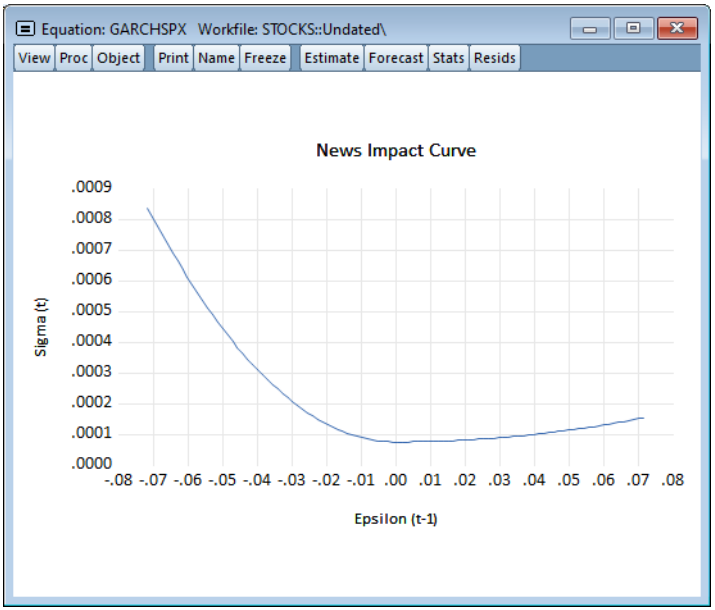
In addition, EViews 12 offers three new views for all GARCH models.

News Impact Curve

A news impact curve plots the change in the conditional volatility against a change (or shock) in past news.

Specifically, the news impact curve uses the estimated GARCH equation specification to plot values of the conditional volatility σ_t^2 against ϵ_{t-1}, while setting $\epsilon_{t-s} = 0$ for $s > 1$, and holding all lagged σ_{t-v}^2 for $v \geq 1$ constant at the unconditional variance.

To display a news impact curve, select **GARCH Graphs/News Impact Curve** from the view menu of an estimated GARCH equation.



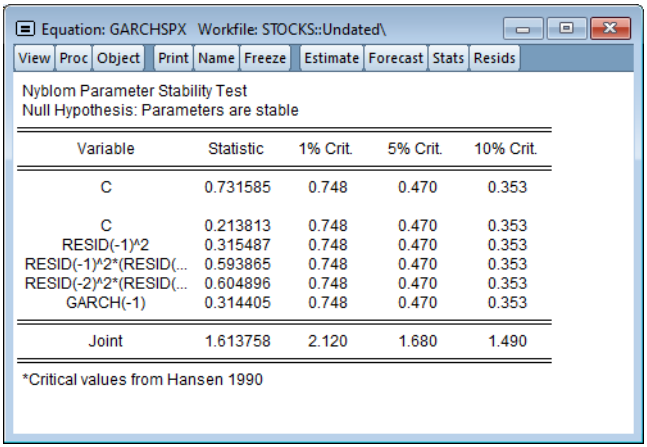
News impact curves are not available for fractionally integrated GARCH models.

- See `Equation::newsimpact` (p. 164) in the *Object Reference* for command line documentation.

Stability Tests

The Nyblom Stability Test is a test of parameter stability or structural change. The test provides individual statistics on each parameter (both in the mean and variance equations) and a joint test of null hypothesis is that the parameters are constant through time.

To compute the test, select **View/Coefficient Diagnostics/Nyblom Stability Test** from the menu of an equation estimated by GARCH:



Equation: GARCHSPX Workfile: STOCKS::Undated\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Nyblom Parameter Stability Test
Null Hypothesis: Parameters are stable

Variable	Statistic	1% Crit.	5% Crit.	10% Crit.
C	0.731585	0.748	0.470	0.353
C	0.213813	0.748	0.470	0.353
RESID(-1)^2	0.315487	0.748	0.470	0.353
RESID(-1)^2*(RESID(...	0.593865	0.748	0.470	0.353
RESID(-2)^2*(RESID(...	0.604896	0.748	0.470	0.353
GARCH(-1)	0.314405	0.748	0.470	0.353
Joint	1.613758	2.120	1.680	1.490

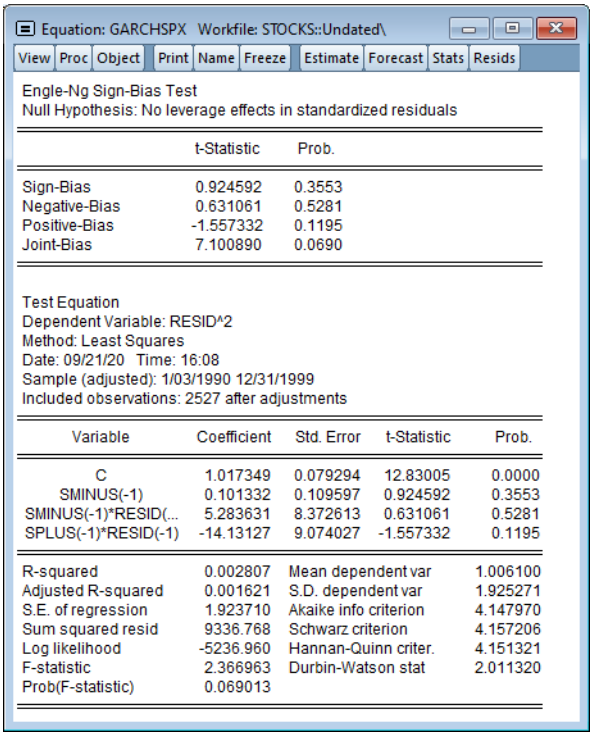
*Critical values from Hansen 1990

- See `Equation::nyblom` (p. 165) in the *Object Reference* for command line documentation.

Sign Bias Misspecification Tests

The **Sign Bias Test** (Engle and Ng, 1993) provides a test for misspecification of the conditional variance model. The test performs a regression of the squared residuals against dummy variables based upon the sign previous residuals. If a GARCH model is correctly specified, the sign of previous residuals should have no impact upon the current squared residuals. The null hypothesis is that the parameters of the regression are zero.

To conduct the test, select **View/Residual Diagnostics/Sign Bias Test** from the menu of an equation estimated by GARCH:



Equation: GARCHSPX Workfile: STOCKS::Undated\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Engle-Ng Sign-Bias Test
Null Hypothesis: No leverage effects in standardized residuals

	t-Statistic	Prob.
Sign-Bias	0.924592	0.3553
Negative-Bias	0.631061	0.5281
Positive-Bias	-1.557332	0.1195
Joint-Bias	7.100890	0.0690

Test Equation
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/21/20 Time: 16:08
Sample (adjusted): 1/03/1990 12/31/1999
Included observations: 2527 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.017349	0.079294	12.83005	0.0000
SMINUS(-1)	0.101332	0.109597	0.924592	0.3553
SMINUS(-1)*RESID(...	5.283631	8.372613	0.631061	0.5281
SPLUS(-1)*RESID(-1)	-14.13127	9.074027	-1.557332	0.1195

R-squared	0.002807	Mean dependent var	1.006100
Adjusted R-squared	0.001621	S.D. dependent var	1.925271
S.E. of regression	1.923710	Akaike info criterion	4.147970
Sum squared resid	9336.768	Schwarz criterion	4.157206
Log likelihood	-5236.960	Hannan-Quinn criter.	4.151321
F-statistic	2.366963	Durbin-Watson stat	2.011320
Prob(F-statistic)	0.069013		

- See `Equation::signbias` (p. 188) in the *Object Reference* for command line documentation.

Elastic Net and Lasso

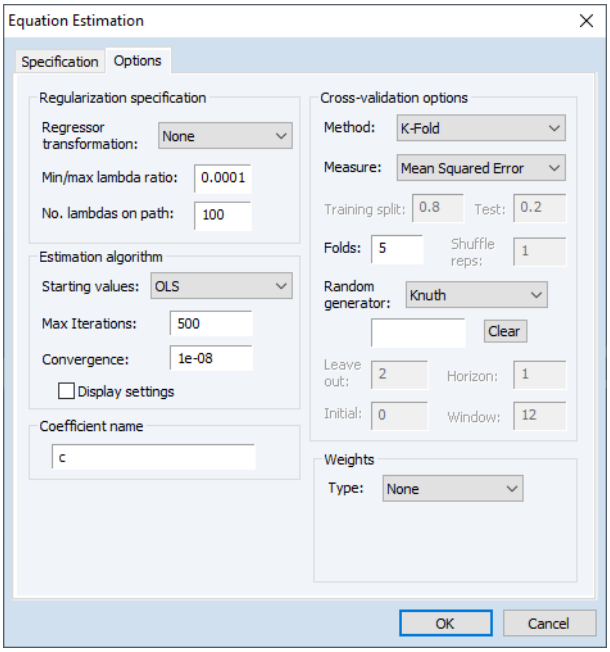
Elastic net regularization is a popular solution to the overfitting problem, where a model fits training data well but does not generalize easily to new test data. Depending on the particular parameters chosen for the elastic net model, some or all of the regressors are preserved, but their magnitudes are reduced.

EViews 11 includes tools for estimation of elastic net, ridge, and Lasso regression models. EViews supports estimation over a single lambda penalization parameter and a grid search over multiple penalization parameters. When multiple parameters are used, EViews also supports options for automatic generation of penalization parameters, as well as cross-validation tools for choosing the parameter with the lowest error.

EViews 12 offer a number of additions to the existing toolkit:

- new cross-validation options for selecting penalty function including rolling and expanding window methods for selecting training and test sets.

- new diagnostics showing training-test set cross-validation composition.
- estimation with observation and variable weights.



- See Chapter 37. "Elastic Net and Lasso," beginning on page 535 in the *User's Guide II* for additional discussion.
- See also `Equation::enet` (p. 93) in the *Object Reference* for command documentation.

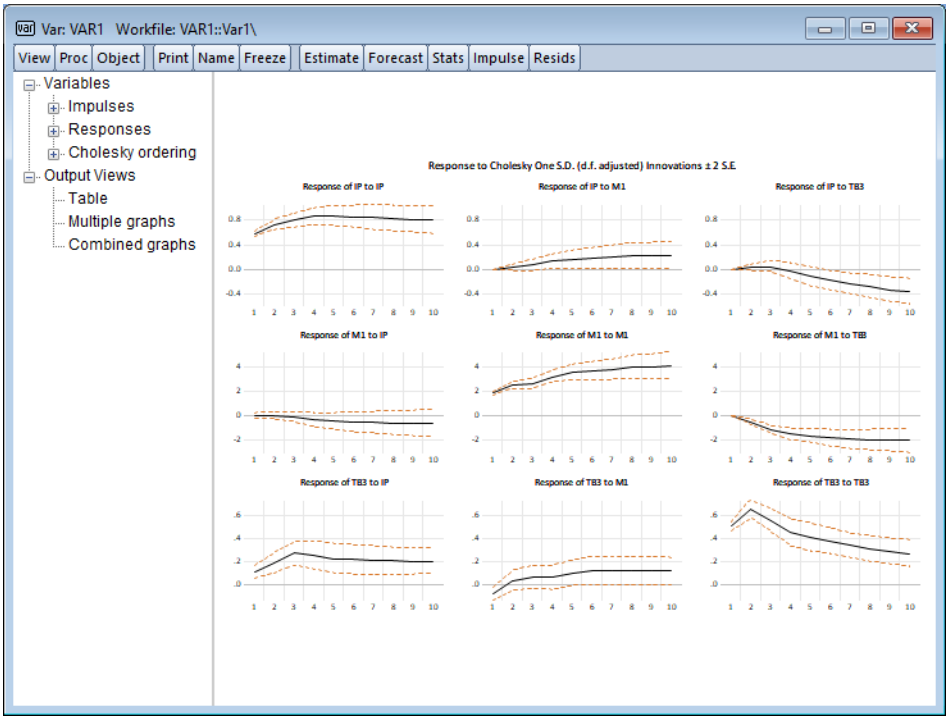
Impulse Response User Interface

EViews 12 features a new interface for computing and displaying impulse responses and confidence intervals for VAR and VEC estimators.

The prior impulse response interface coupled the choices for which impulses and responses to display and the method in which they were displayed, with the various options for computing the impulse response and standard error. Thus, if a user first displayed a multiple graph of impulse responses and then wanted to show the results in a table, or perhaps display a subset of those original responses, the procedure would have to be respecified and recomputed from the beginning.

The new, dynamic EViews 12 interface allows for interactive selection of the impulse and responses to be displayed, as well as the method of display. This flexibility is particularly

important in light of the introduction of new, computationally intensive, VAR and VEC bootstrap confidence interval evaluation methods ("Bootstrap Impulse Response Confidence Intervals" on page 52).



- See "Displaying Impulse Responses in EViews" on page 856 in the *User's Guide II* for discussion and additional detail.

Bootstrap Impulse Response Confidence Intervals

EViews 12 introduces several new bootstrapping approaches to computing the confidence intervals for both VAR and VEC impulse responses.

These new tools allow you to compute residual bootstrap, residual double bootstrap, and fast residual double bootstrap estimates of these confidence intervals. EViews supports a variety of confidence interval bootstrap methods, including standard percentile, Hall's (1992) percentile confidence intervals, Hall's (1986) studentized confidence interval, and Killian's (1998) unbiased confidence interval.

- See "Response Standard Errors and Confidence Intervals" on page 854 and "Impulse Response Standard Errors and Confidence Intervals" on page 887 in the *User's Guide II* for discussion and additional detail.

- See `Var::impulse` (p. 1018) in the *Object Reference* for updated command documentation.

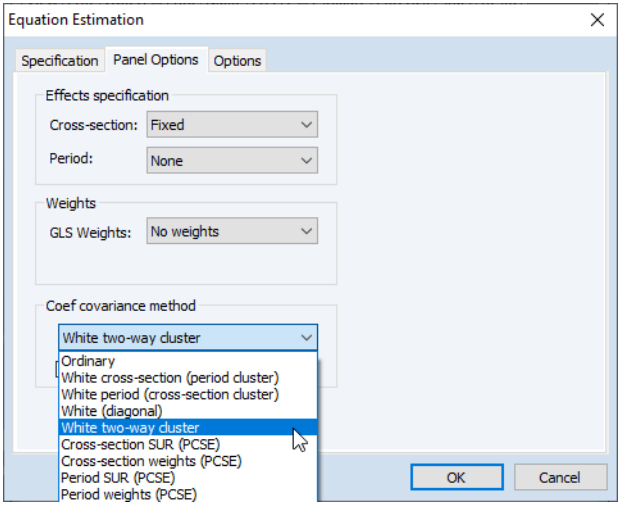
Panel and Pool Two-way Cluster Robust Covariances

In many settings, observations may be grouped into different groups or "clusters" where errors are correlated for observations in the same cluster and uncorrelated for observations in different clusters. This cluster error correlation must be accounted for in computing estimates of the precision of regression estimates.

In a panel equation and pool settings, versions of EViews prior to EViews 12 offered tools for computing coefficient covariances accounting for clusters defined by cross-section units *or* by periods. Following the lead of the system estimation literature, these robust standard error calculations were termed "White cross-section" for clustering by period, to indicate that there was contemporaneous correlation between cross-section units, and termed "White period" for clustering by cross-section, to indicate that there was between period correlation within a cross-section unit.

EViews 12 extends these tools to allow for computation of robust covariances when clusters are defined by both cross-section units *and* periods (Petersen 2009, Thompson 2011, Cameron, Gelbach, and Miller 2015).

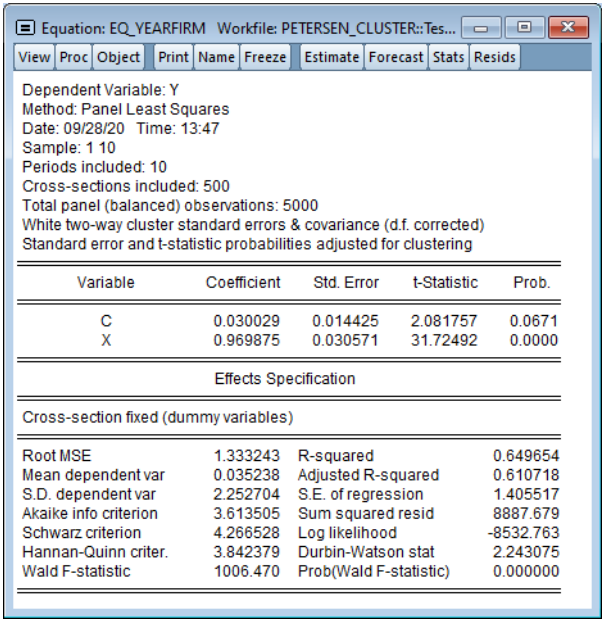
To estimate a two-way cluster robust coefficient covariance in EViews, open the equation dialog in your panel workfile, then click on the **Options** tab to display the panel equations options page:



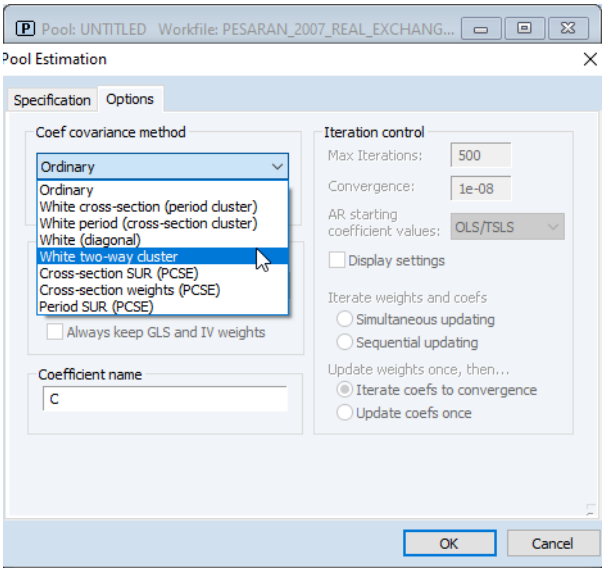
In the **Coef covariance** method combo on the left, select **White cross-section (period cluster)** for one-way period clustering, **White period (cross-section clustering)** for one-way

cross-section clustering, **White (diagonal)** for unstructured heteroskedasticity robust covariances, or **White two-way cluster** for clustering by both cross-section and period.

Click on **OK** to estimate the equation with this option and display the estimation results.



You may also compute two-way clustered standard errors in pooled data settings. Simply open the pool object, click on **Estimate**, and then on the **Options** tab:



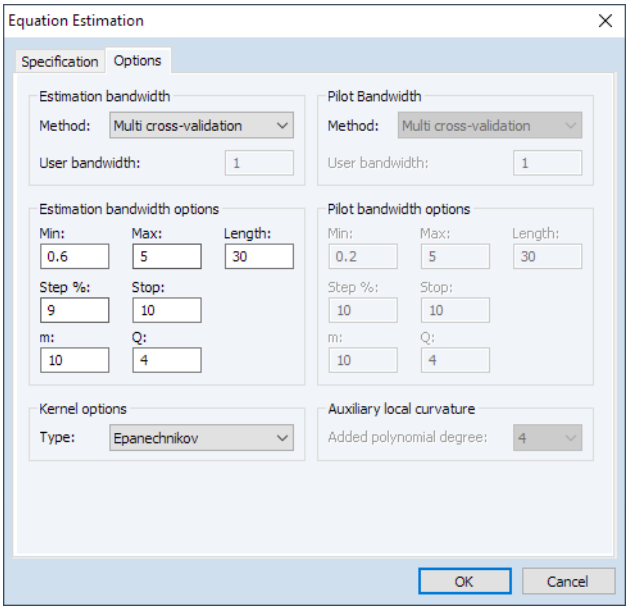
- See"Cluster-Robust Covariances" on page 39 and "Least Squares Panel Options" on page 1136 in the *User's Guide II*.
- See `Equation::ls` (p. 138) and `Pool::ls` (p. 578) in the *Object Reference* for command line documentation.

Note that to support these new features, panel equations and pools with cluster robust or PCSE and TCSE standard errors estimated by EViews 12 are not backward compatible with earlier versions of EViews.

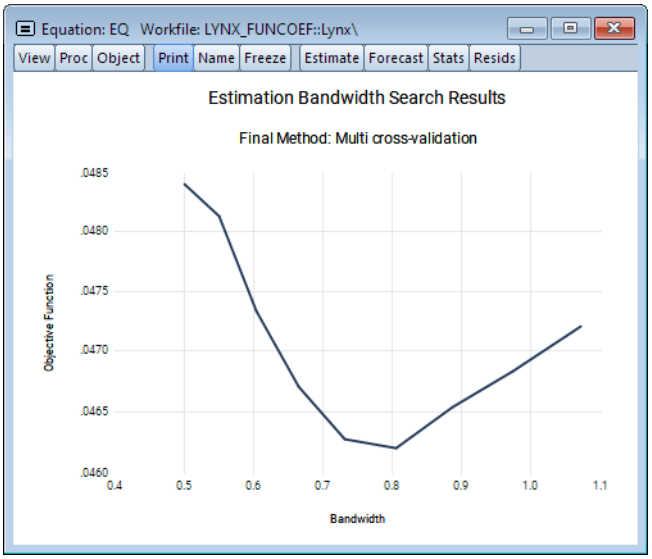
Functional Coefficients Models

Functional coefficient regression is a semi-parametric approach to extend the standard regression framework by allowing the β_j to be functions of the variable Z_t (Fan and Gijbels (1996); Cai, Fan, and Yao (2000)).

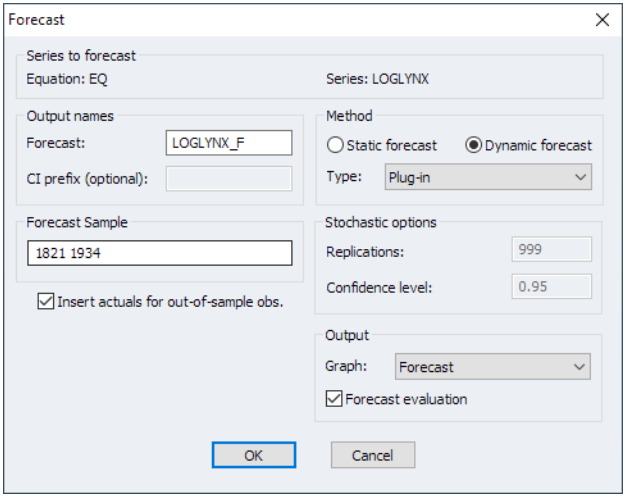
EViews 12 offers a completely revamped interface for estimating and working with these models along with new tools for examining the properties of your functional coefficients estimates:



- Enhanced Interface provides additional control over the computation of final and pilot bandwidths, with new methods for obtaining bandwidths.
- New views permit examination of the bandwidth selection procedure results for both pilot and final bandwidths, and functional bias curves.



- Sophisticated forecasting engine performs static and dynamic forecasting via plug-in, Monte Carlo (asymptotic), Monte Carlo bootstrap, and full bootstrap methods. Stochastic resampling routines support computation of simulation based forecast standard errors and confidence intervals:



- New proc allows you to specify a local pilot bandwidth that is independent of the estimation pilot bandwidth for computation of diagnostic views.

Note that to support these new features, functional coefficients models estimated by EViews 12 are not backward compatible with earlier versions of EViews.

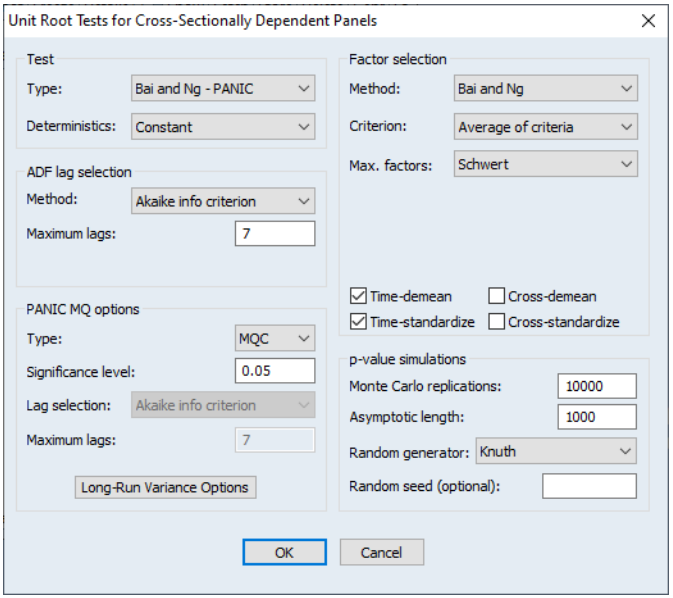
- For additional detail, see Chapter 38. "Functional Coefficient Regression," beginning on page 557 in the *User's Guide II*.
- See `Equation::funcoef` (p. 107) in the *Object Reference* for command line documentation.
- In addition, there are a number of different views and procedures of interest that are new or enhanced. See "Equations" (p. 69).

Cross-Sectionally Dependent Panel Unit Root Tests

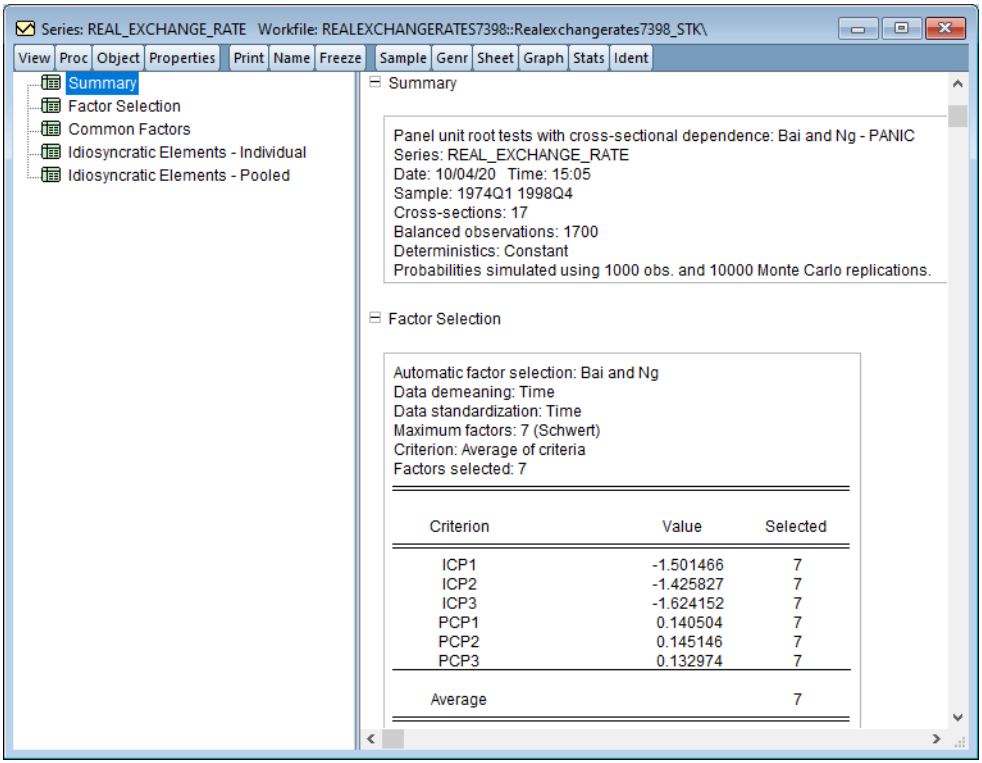
Since many economic time series have short samples but are observed over many cross-sections, multivariate unit root tests that combine results for different cross-sections, colloquially referred to as *first generation panel unit root tests,* offered improved statistical power over their univariate counterparts. These first generation panel unit root tests involve unit root testing on pooled panel data, with (possibly) individual trend, intercepts, and lag coefficients. While this framework is a natural first step, it comes at the steep cost of requiring cross-sectional independence.

Tests which account for cross-sectional dependence have been termed *second generation panel unit root tests*. EViews current supports two important second generation contributions: Panel Analysis of Nonstationarity in Idiosyncratic and Common Components (PANIC) due to Bai and Ng (2004), and Cross-sectionally Augmented IPS (CIPS), developed by Pesaran (2007).

Second generation panel unit root tests may be performed on a single series in a panel workfile or on a group of series in a workfile. To perform the test in the panel setting, you should open the series and then click on **View/Unit Root Tests/Cross-Sectionally Dependent...** EViews will display the dialog:



You may use the **Type** dropdown to choose PANIC or CIPS testing. Options include the lag selection for the ADF test, MQ testing, factor selection, and p-value simulation settings.



Note that in the group setting, you may perform the same test by opening the group object and clicking on **View/Unit Root Tests/Cross-Sectionally Dependent...**.

- See "Cross-sectionally Dependent Panel Unit Root Tests" on page 716 in the *User's Guide II* for discussion and additional detail.
- See also (`Series::uroot2` (p. 750), `Group::uroot2` (p. 441), and `Pool::uroot2` (p. 603) in the *Object Reference* for command documentation.

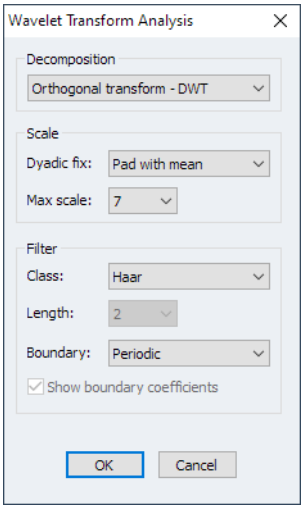
Wavelet Decomposition

Wavelet decomposition can decompose a series into its long-run behavior (smooths) and short run behavior (details). Among other things, wavelets may be used to

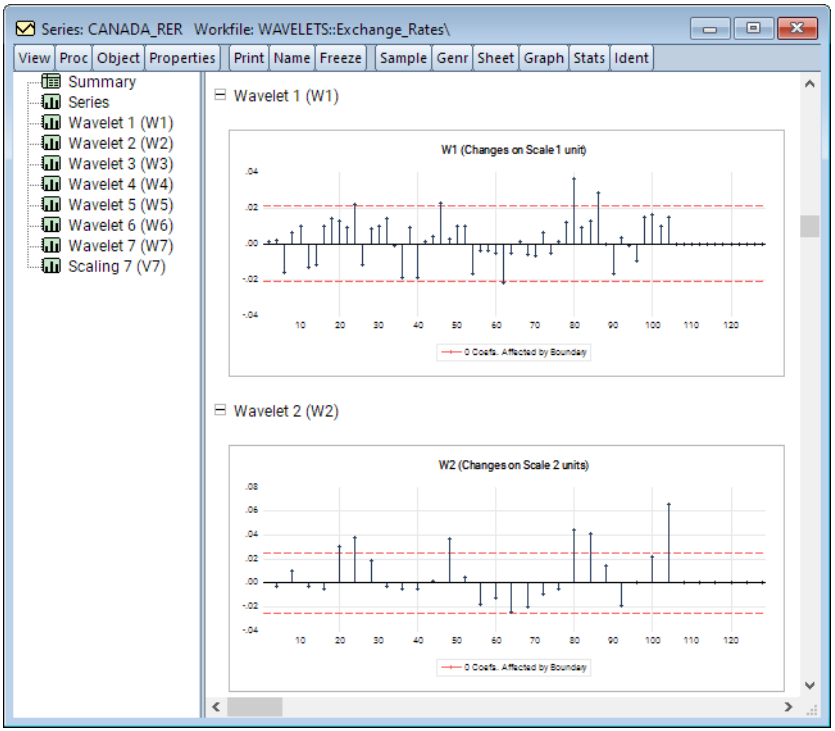
- compute the discrete wavelet transform to decompose a series into short and long run components at different scales
- obtain a long-run approximation to a series by neglecting transient features (thresholding)
- detect outliers

- decompose a series variance

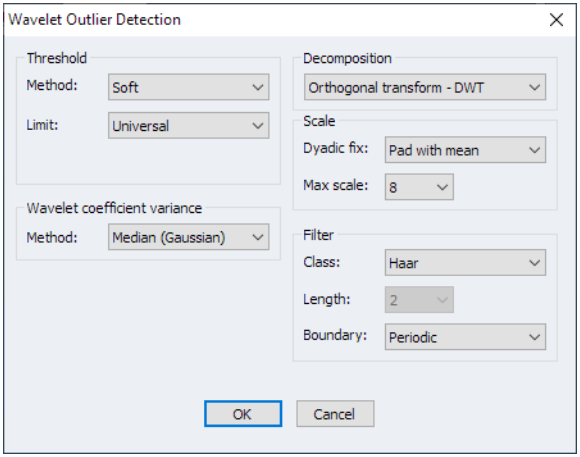
EViews offers an easy to use interface for each of these tasks. For example, To perform wavelet decomposition in EViews 12, open the series of interest and select **View/Wavelet Analysis/Transform...**

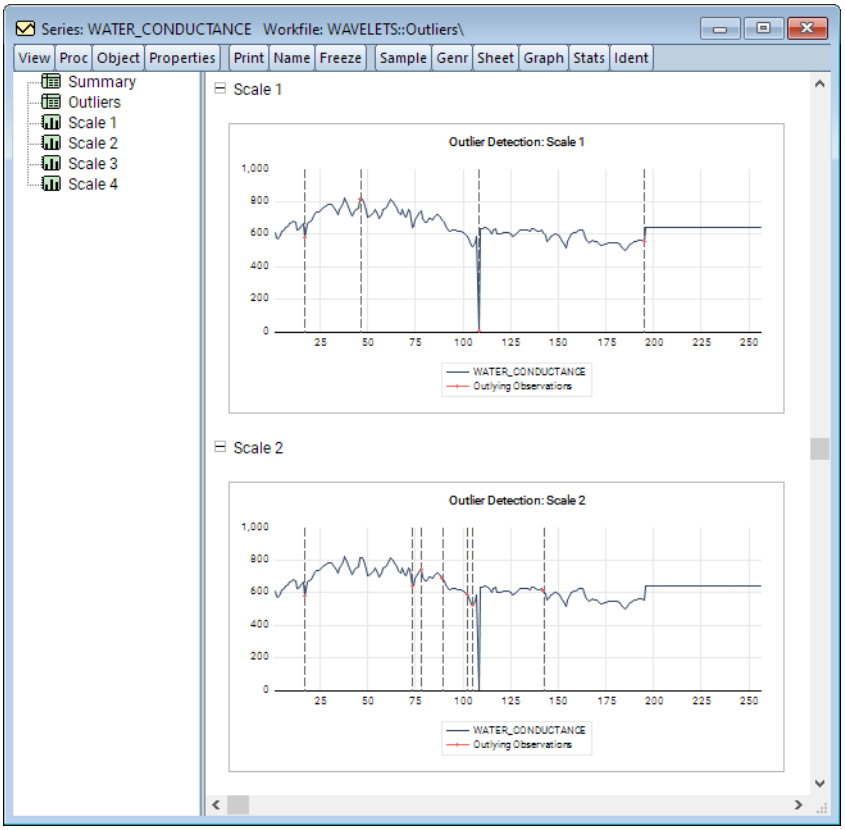


There are several entries under this menu item, each with its own set of options. The spool output lets you examine many features of the decomposition:



To detect outliers, select **View/Wavelet Analysis/Outlier Detection...**

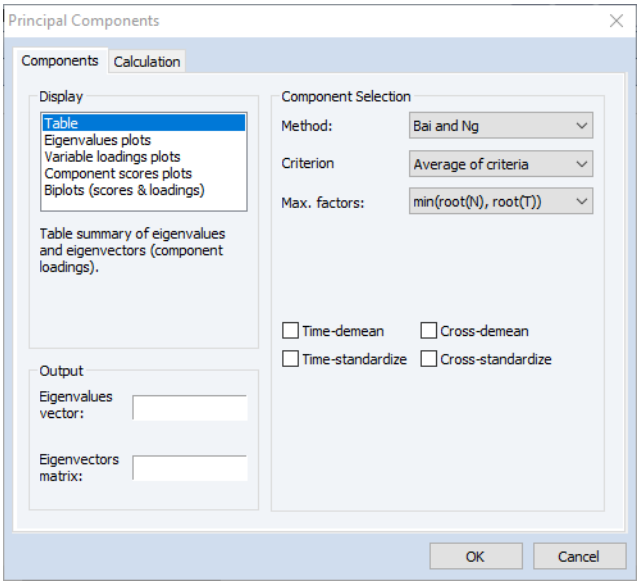




- See "Wavelet Analysis," on page 753 in the *User's Guide II* for extensive documentation.
- See also `Series::wavedecomp` (p. 760), `Series::waveanova` (p. 758), `Series::waveoutlier` (p. 762), `Series::wavethresh` (p. 765), and `Series::makewavelets` (p. 695) in the *Object Reference* for command line documentation.

Number of Factor Selection Methods

EViews 12 adds the Bain and Ng (200) and Ahn and Horenstein (2013) methods for determining the number of factors to retain to our existing principal components and factor analysis engines.



- A discussion of these methods (in the context of panel data unit root tests) is provided in "Determining the Number of Components" on page 650 in the *User's Guide I*.
- See `Group::pcomp` (p. 413) and `Matrix::pcomp` (p. 500) in the *Object Reference* for command documentation of principal components.
- See "Factor" on page 70 for estimation methods and factor views that use the new factor selection methods.

Models

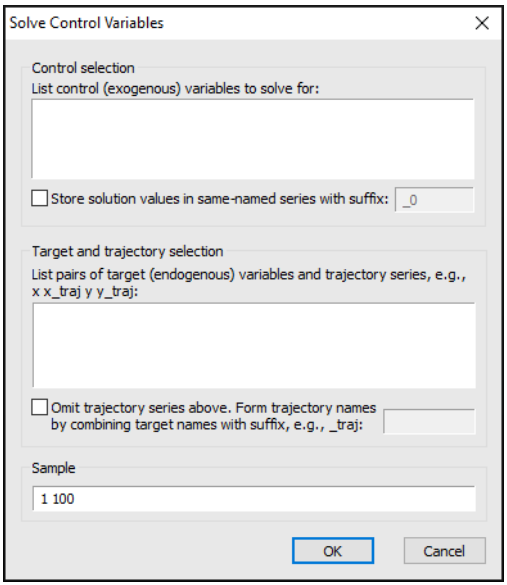
EViews 12 offers powerful new features for working with models. New methods allow you to solve your control to match an endogenous target, or to change the specification of the endogenous variable in an equation.

Solve Control for Target

Normally, when solving a model, we start with a set of known values for our exogenous variables, then solve for the unknown values of the endogenous variables of the model. If we would like an endogenous variable in our model to follow a particular path, we can solve the model repeatedly for different values of the exogenous variables, changing the values until the path we want for the endogenous variable is produced. For example, in a macroeconomic model, we may be interested in examining what value of the personal tax rate would be needed in each period to produce a balanced budget over the forecast horizon.

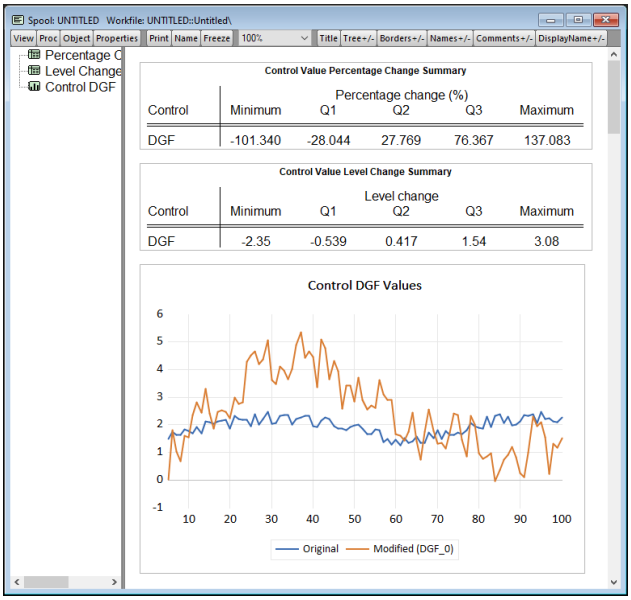
The problem with carrying out this procedure by hand is that the interactions between variables in the model make it difficult to guess the correct values for the exogenous variables. It will often require many attempts to find the values that solve the model to give the desired results. EViews can address this challenge in two ways. The first is to perform a numerical optimization of the exogenous variable values, automating the search for exogenous values that lead to the desired endogenous values. The second approach re-specifies the model in such a way that we can directly solve for the exogenous values.

After creating series holding the trajectory values for our endogenous target variables, we can conduct a search for the precipitating values of our exogenous control variables via the **Solve Controls for Targets…** item under the model's **Proc** menu.



The required parameters are a list of control variables (in the upper text area) and a list of target variables and trajectory series (in the lower text area). These lists may include group objects. The sample over which new control values will be calculated defaults to the current workfile sample. The solved control values will be stored in the original control series by default. The **Store solution values…** checkbox lets you indicate that the results should be stored in an alternative set of series with the adjoining suffix. This suffix defaults to the active scenario alias suffix, which allows the results to be easily applied to the model via a scenario override. As a convenience, if the trajectory series names are just the target variable names with a suffix applied, you may use the **Omit trajectory series…** checkbox and adjoining field to shorten the required parameters.

After clicking the **OK** button, EViews will determine an appropriate lag for each control variable, conduct the search over control values, and then display a summary of the results in the open model window. The image below shows an example results summary for a single control named DGF.



This summary is a transient rather than a persistent model view and will be lost on the next view change if not frozen.

There are three notable limitations of this numeric approach.

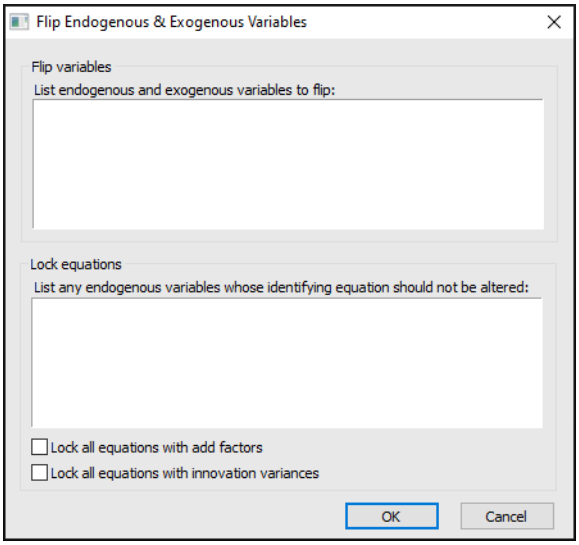
- The model may not contain leads (positive lags).
- There must be an equal number of control and target variables. The overdetermined case with more target variables than control variables is not supported currently.
- The procedure may take some time to complete. Depending on the dependencies among the variables and the control lags selected, the optimization may require multiple bidirectional passes over the sample observations, causing the solution time to be far greater than a standard model solve.

It is also possible for the search to fail, with EViews unable to discovery a set of satisfactory control variable values. You can always alter the control series values (the search's starting values) and try again.

Endogenous Variable Specification

The alternative to a numerical search for exogenous values is to respecify the model such that the exogenous control variables are made endogenous and the endogenous target series are made exogenous. The values of the control series can then be computed using the standard model solve procedure (with the trajectory series overriding the target series). You can

automatically rewrite a model's equations to select a new set of endogenous variables via the **Flip Endog/Exog Variables…** item under the model's **Proc** menu.



The required parameter is a list of endogenous and exogenous variables to flip (in the upper text area). There must be an equal number of endogenous and exogenous variables (but not add factors) that may be specified in any order. The list may include group objects.

EViews will automatically determine a minimal set of equations to rewrite symbolically. The number of equations rewritten will be at least the number of specified exogenous variables, but could be much greater. If a rewritten equation was included in the model via a linked object, *e.g.,* a VAR, system, or another model, then the link to that object will be broken.

If there are equations that you wish to exclude from being rewritten, you may list the endogenous variable for these "locked" equations in the lower text area. Additionally, you may lock all equations that have associated add factors or innovation variances with the appropriate check box. Naturally, endogenous variables being flipped should not be locked.

Once you click the **OK** button, EViews will determine which equations need to be rewritten and then modify the model object accordingly. A summary of the changes made to the model is displayed in the model window.

This approach has several limitations to be aware of:

- Equations containing ARMA specifications will not be altered by this procedure and are treated as locked.
- Currently, all rewritten equations lose their add factors. This deficiency will hopefully be addressed in a future update, but for the moment, locking all equations with add factors is the only way to prevent such information loss.
- Rewriting equations is a process of algebraic manipulation, since we are essentially solving equations for a new set of left-hand side variables. Consequently, we are limited by the set of invertible mathematical operations.

It is possible that EViews will be unable to rewrite the model's equations to produce the desired set of endogenous variables. If you have explicitly locked any equations, you may retry with fewer locked equations, hopefully providing EViews with enough options to be successful.

- See `Model::control` (p. 528) and `Model::fliptype` (p. 534) in the *Object Reference* for command documentation.

Command Language

Object Data Members

EViews 12 offers an expanded set of object data members that provide access to information about the object.

Equation Data Members

Scalar values

@lambdamin..... minimum lambda value from ENET cross-validation (*new*).

Vectors and Matrices

@cvtrainindices.... training set indices for ENET cross-validation (*new*).

@cvtestindices ..... test set indices for ENET cross-validation (*new*).

Model Data Members

String values

@depends("variable") ....string containing the variables that "variable" depends on (*new*).

@upends("variable") .....string containing the variables that depend on "variable" (*new*).

Series Data Members

@hilo..... string containing the series object's high-to-low frequency conversion method (*new*).

@lohi..... string containing the series object's low-to-high frequency conversion method (*new*).

Table Data Members

String values

(i,j) ..... the (i,j)-th element of the table, formatted as a string (*updated*).

Scalar values

@colwidth(i)..... the column width of the i-th column in the table (*new*).

@rowheight(i) ..... the row height of the i-th row in the table (*new*).

@val(i,j) .....the numerical value of the (i,j)-th element of the table (*new*).

Updated Command List

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

Commands

dbopen.....open a database (p. 350) (*updated*).

logeval.....sends result of the command to a log window (p. 420) (*new*).

pagesave .....save page into a workfile or a foreign data source (p. 458) (*updated*).

wfsave .....save workfile to disk as a workfile or a foreign data source (p. 555) (*updated*).

Updated Object List

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

Equations

Equation Methods

arch .....estimate autoregressive conditional heteroskedasticity (ARCH and GARCH) (p. 45) (*updated*).

enet .....elastic net regression (including Lasso and ridge regression) (p. 93) (*updated*).

funcoef .....functional coefficients regression (p. 107) (*updated*).

ls .....equation using least squares or nonlinear least squares (p. 138) (*updated*).

midas.....estimate an equation using Mixed Data Sampling (MIDAS) regression (p. 159) (*updated*).

varsel.....equation estimation using least squares with variable selection (uni-directional, stepwise, swapwise, combinatorial, Auto-GETS, Lasso) (p. 208) (*new*).

Equation Views

cvtestindices.....matrix of the test set indices for observations and cross-validation sets (p. 89) (*new*).

cvtrainindices.....matrix of the training set indices for observations and cross-validation sets (p. 89) (*new*).

funbias.....functional coefficients equation bias results (p. 103) (*updated*).

funbw.....functional coefficients equation bandwidth results (p. 104) (*updated*).

funci ..... functional coefficients equation coefficient confidence intervals (p. 105) (*updated*).
funcov ..... functional coefficients covariance results (p. 110) (*updated*).
funtest ..... perform functional coefficients hypothesis and stability tests (p. 112) (*updated*).
newsimpact ..... display a news-impact graph of equations estimated using GARCH (p. 164) (*new*).
nyblom ..... perform the Nyblom test of parameter stability or structural change in equations estimated using GARCH (p. 165) (*new*).
signbias ..... perform the Sign-bias test (Engle and Ng, 1993) of misspecification in equations estimated using GARCH (p. 188) (*new*).

Equation Procs

fit ..... static forecast (p. 97) (*updated*).
forecast ..... dynamic forecast (p. 101) (*updated*).
makefunobj ..... save coefficients, residuals, bias, variance, and confidence intervals for functional coefficients equations (p. 148) (*new*).
setpilotbw ..... compute and set the value of the local pilot bandwidth (for functional coefficients equations) (p. 187) (*new*).

Factor

Factor Methods

gls ..... generalized least squares estimation (p. 228) (*updated*).
ipf ..... iterated principal factors estimation (p. 233) (*updated*).
ml ..... maximum likelihood estimation (p. 243) (*updated*).
pace ..... non-iterative partitioned covariance estimation (PACE) (p. 249) (*updated*).
pf ..... principal factors estimation (p. 254) (*updated*).
uls ..... unweighted least squares estimation (p. 269) (*updated*).

Factor Views

fsel ..... display results of Bai and Ng or Ahn and Horenstein factor selection techniques (p. 228).

Geomap

Geomap Procs

autocrop ..... calculates and resets the minimum viewable size of a geomap (p. 280) (*new*).

Graph

Graph Creation Command

line ..... line-symbol graph (p. 1108) (*updated*).

xyerrbar.....xy-error bar graph (p. 1142) (*new*).

Graph Procs

delete.....removes all objects of specified type from a graph object (p. 324) (*new*).

draw.....draw lines and shaded areas on the graph (p. 325) (*updated*).

save.....save graph to a graphics file (p. 346) (*updated*).

Group

Group Views

pcomp.....principal components analysis on the members of the group (p. 413) (*updated*).

uroot2.....Compute dependent (second generation) panel unit root tests on a group of series (p. 441) (*new*).

Matrix

Matrix Views

pcomp.....principal components analysis of the columns in a matrix (p. 500) (*updated*).

Model

Model Procs

control.....solve for values of control variables so that targets match trajectories (p. 528) (*updated*).

fliptype.....respecify model by selecting a new set of endogenous variables (p. 534) (*new*).

Pool

Pool Methods

ls.....estimate linear regression models including cross-section weighted least squares, and fixed and random effects models (p. 578) (*updated*).

Pool Views

uroot2.....compute dependent (second generation) panel unit root tests on a pool series (p. 603) (*new*).

Series

Series Views

uroot2.....compute dependent (second generation) panel unit root tests on a series in a panel workfile (p. 750) (*new*).

waveanova ..... compute the wavelet variance decomposition of the series (p. 758) (*new*).

wavedecomp ..... compute the wavelet transform of the series (p. 760) (*new*).

waveoutlier ..... perform wavelet outlier detection for the series (p. 762) (*new*).

wavethresh..... perform wavelet thresholding (denoising) of the series (p. 765) (*new*).

Series Procs

makewavelets..... save wavelet results to workfile (p. 695) (*new*).

Table

Table Procs

save ..... save table as CSV, tab-delimited ASCII text, RTF, HTML, Enhanced Metafile, PDF, TEX, or MD file on disk (p. 941) (*updated*).

setfillcolor ..... set the fill (background) color of a set of table cells (p. 943) (*updated*).

transpose..... transposes a set of cells in the table (p. 961) (*new*).

Text

Text Procs

save ..... save text object to disk as an ASCII text, RTF, HTML, PDF, TEX, or MD file (p. 969) *(updated)*.

Valmap

Valmap Procs

append..... append a definition to a valmap (p. 984) (*updated*).

VAR

Var View

impulse..... impulse response functions (p. 1016) *(updated)*.

EViews 12 Compatibility Notes

The following discussion describes EViews 12 compatibility issues for users of earlier versions.

Workfile Compatibility

With few exceptions, EViews 12 workfiles are backward compatible with EViews 10. Note that the following objects are new or have been modified in Version 11:

- Estimation objects estimated with methods that employ new features (functional coefficients, elastic net, FI(E)GARCH, variable selection, indicator saturation, MIDAS with

gets, panel and pool estimators with new cluster robust covariances, or new degrees-of-freedom corrections).

If you have saved workfiles containing any of the above objects and open them in earlier versions, 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.

Computational Compatibility

- EViews 12 panel and pool estimators with cluster style robust covariances now employ a stronger degrees-of-freedom correction that is more in line with the cluster literature. The new correction will adjust coefficient standard errors downward to a greater degree than before. Because of this difference, estimators using these new corrections are not backward compatible.