Bloomberg[1] Database Extension for EViews

Overview

The Bloomberg Database Extension is a new feature for EViews 8.1 that adds easy access to Bloomberg's extensive collection of market and economic data from within EViews.

The Bloomberg extension allows you to fetch data directly into an EViews workfile without resorting to awkward intermediate formats. You can link series in your workfile to Bloomberg data and ask EViews to update them automatically. The extension also provides the ability to search through Bloomberg securities and fields within EViews so you can easily find whatever data you need.

The Bloomberg extension is implemented using the EViews Database Extension (EDX) interface. The EDX interface is a publically available interface available in EViews 8.1 Enterprise Edition that allows access to additional data sources to be plugged in to EViews on the fly. Documentation for the interface can be found at http://www.eviews.com/EViews8/Enterprise/EDX.html.

The Bloomberg database extension uses the Bloomberg Open API to access Bloomberg data. The Open API is a set of freely available software development kits that allow software developers to create applications that consume Bloomberg data. For more about the Bloomberg Open API, see http://www.bloomberglabs.com/api.

Requirements

To use the Bloomberg database extension you must satisfy the following requirements:

1) You must have a copy of EViews 8.1 Enterprise Edition installed on your machine
2) You must have the Bloomberg Professional application software installed on your machine
3) You must have a currently active subscription to Bloomberg and be able to log into the Bloomberg Professional terminal on your machine.

Note that the Bloomberg database extension for EViews currently only supports Bloomberg Desktop API configurations. Bloomberg Server API and B-Pipe configurations are not currently supported by EViews.

[1] Bloomberg is a trademark of Bloomberg Finance L.P.

Getting started

The Bloomberg database extension augments the existing database functionality of EViews to include access to Bloomberg data. If you have used EViews databases before, much of the functionality will be familiar to you. If you have never used EViews databases before, you may want to refer to Chapter 10 “EViews Databases” in EViews User’s Guide I for an overview or for additional details.

A database in EViews is simply a container of objects where each object is identified by a name. A database may represent anything from a simple local file to a web based data server. A database can contain any EViews object, although a typical database mainly contains time series.

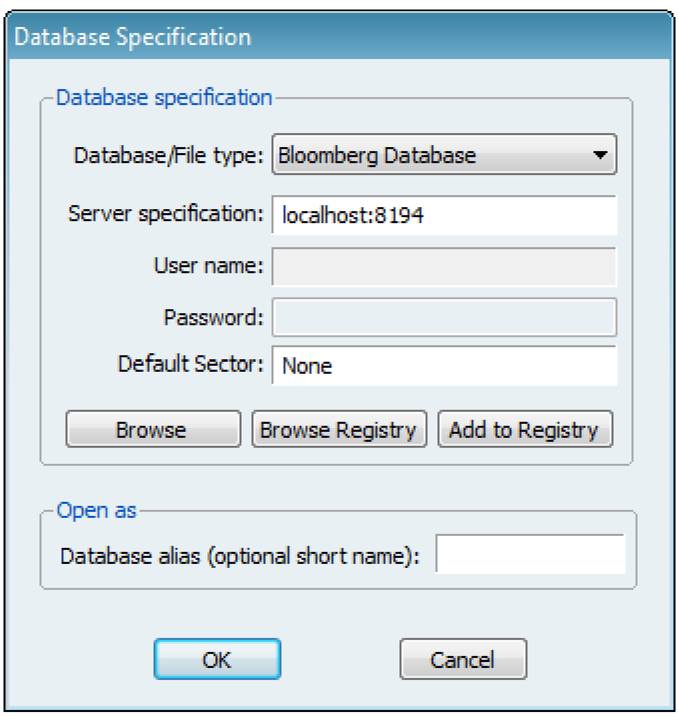
A database differs from an EViews workfile in that:

- objects within a database are not loaded into memory when the database is opened.
- time series within a database may have a mix of frequencies, start and end dates

These features make a database well suited to representing a large and/or varied collection of data within EViews. Note, however, that data within a database must always be imported into a workfile before EViews can view, analyze or manipulate the data.

The first step in working with any database is to open a window to the database.

To open a window to Bloomberg, choose File…Open Database… from the EViews menus, then select ‘Bloomberg Database’ from the ‘Database/File type’ dropdown. The following dialog should appear:



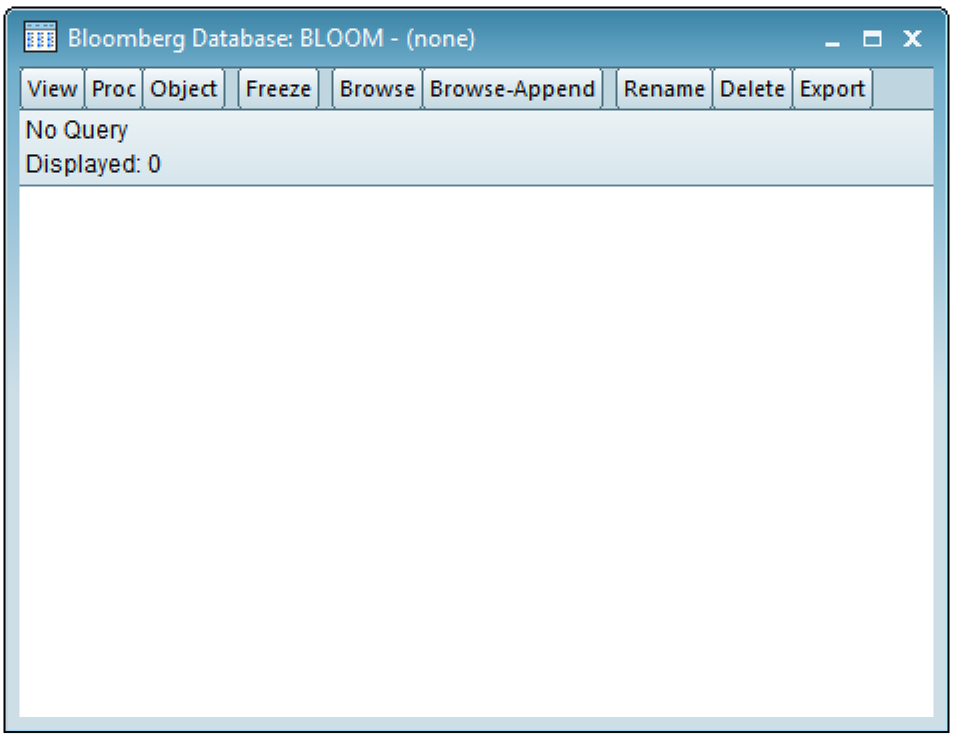
In most cases, you should simply be able to click on ‘OK’ to get started.

The Server specification field should contain the address of your Bloomberg communication server. The default value should be correct for a standard installation of the Bloomberg Professional software.

The Default Sector field can be used to specify a market sector (Bloomberg 'Yellow Key') that should be added to a security name when no market sector is explicitly specified within the identifier. Click on the 'Browse' button to see the list of available options. A value of 'None' means that a market sector must always be included in the security name.

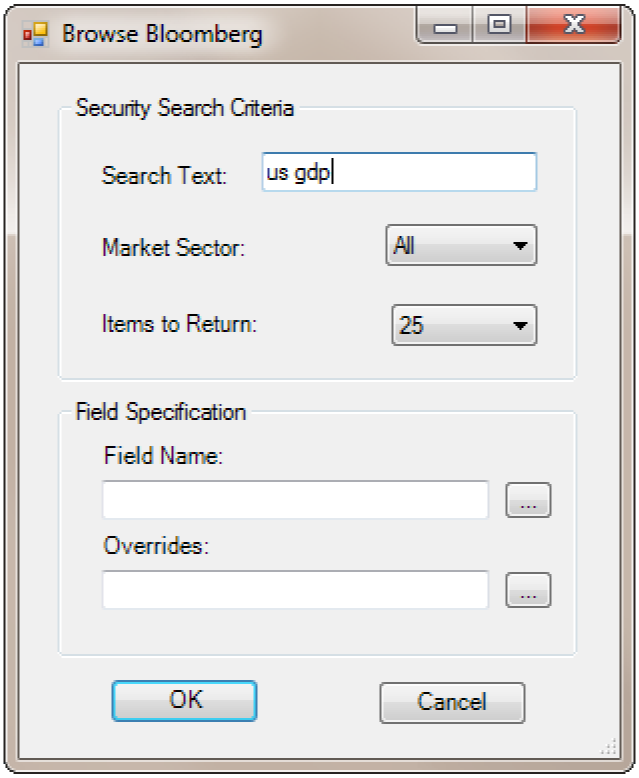
Note that username and password are not required in the dialog because the Bloomberg Professional software performs all necessary user authentication. You should first log on within the Bloomberg terminal before attempting to open a connection to Bloomberg within EViews.

Clicking on 'OK' should bring up a Bloomberg database window.



The database window represents a connection to Bloomberg data.

The first step in retrieving data is to find a series that we would like to fetch. Click on 'Browse' to bring up the search dialog.

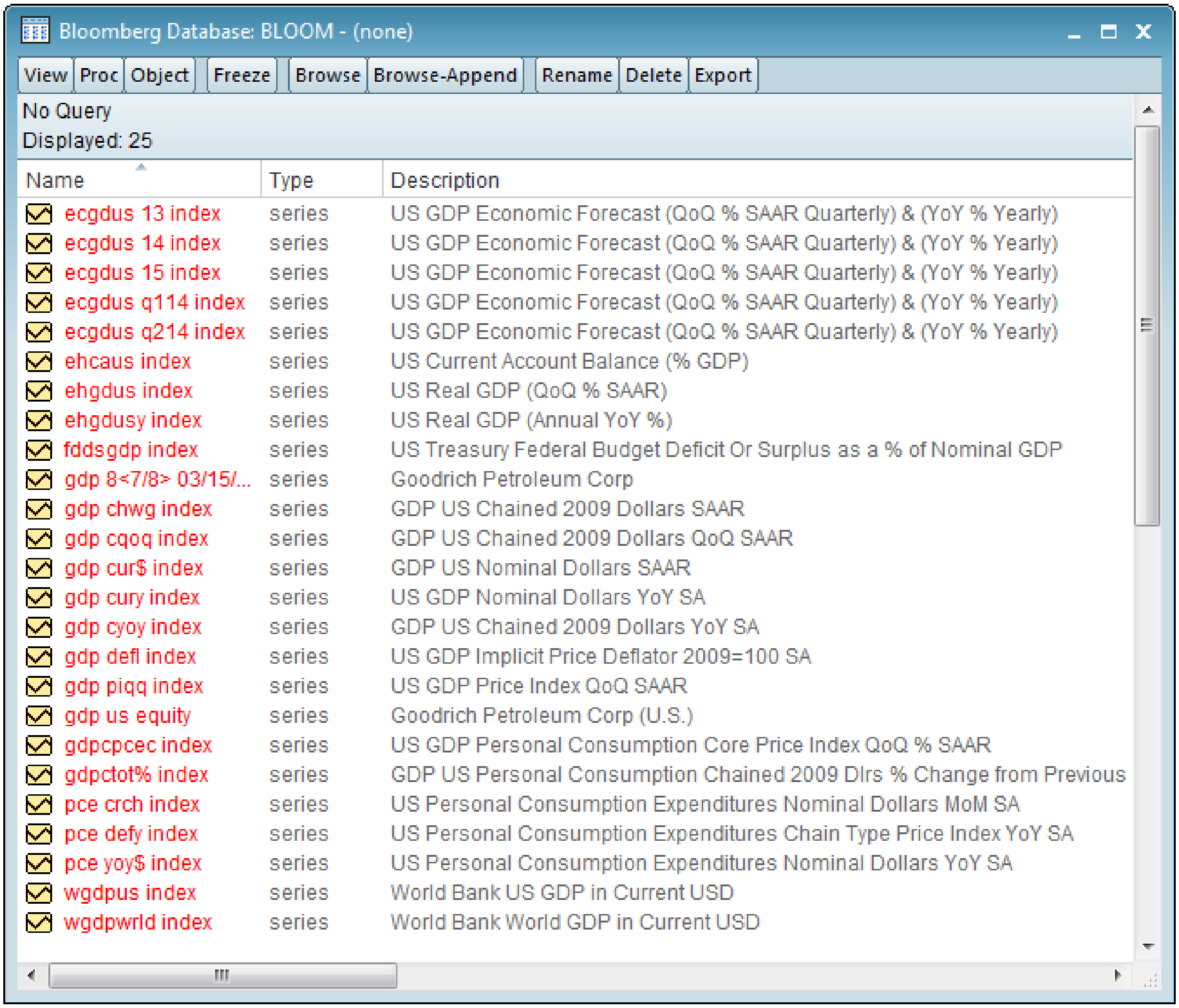


The ‘Search Text’ field allows you to enter one or more keywords to search for. The ‘Market Sector’ field lets you restrict the search to a particular Bloomberg market sector. (If you are using a Bloomberg keyboard you can change the market sector field by pressing a Yellow Key).

The ‘Items to Return’ field specifies how many items to return from the search. Bloomberg is very effective at selecting relevant results so only a small number of results is generally needed.

The Field Name and Overrides boxes allow you to specify what particular information about a security you would like to fetch. By default EViews will fetch the field ‘PX_LAST’ without any overrides. We will discuss this further in the section Using Bloomberg Fields and Overrides below.

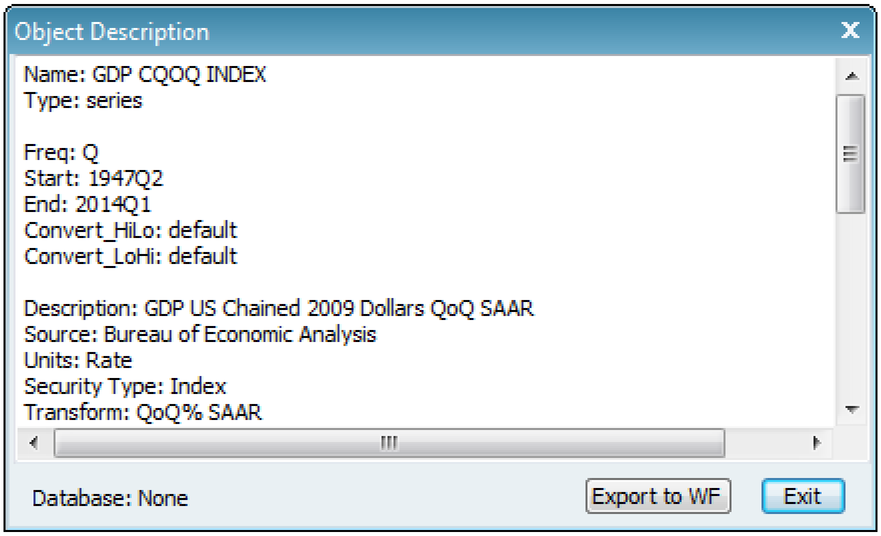
For now, type ‘us gdp’ into the Search Text box and hit enter. You should return to the database window with the following search results displayed.



Each row of the search results contains an identifier for a Bloomberg security and a short description of the security. (The names are displayed in red since names containing spaces are illegal within EViews, so they will need to be modified before they can be used within an EViews workfile).

The names of different types of Bloomberg securities follow different patterns, but from the point of view of EViews they are all treated as simple text identifiers. Note that all Bloomberg security names end with a market sector/yellow key.

You may double click on any security to get more detailed information. For example, double clicking on “gdp cqoq index” produces the following summary information:

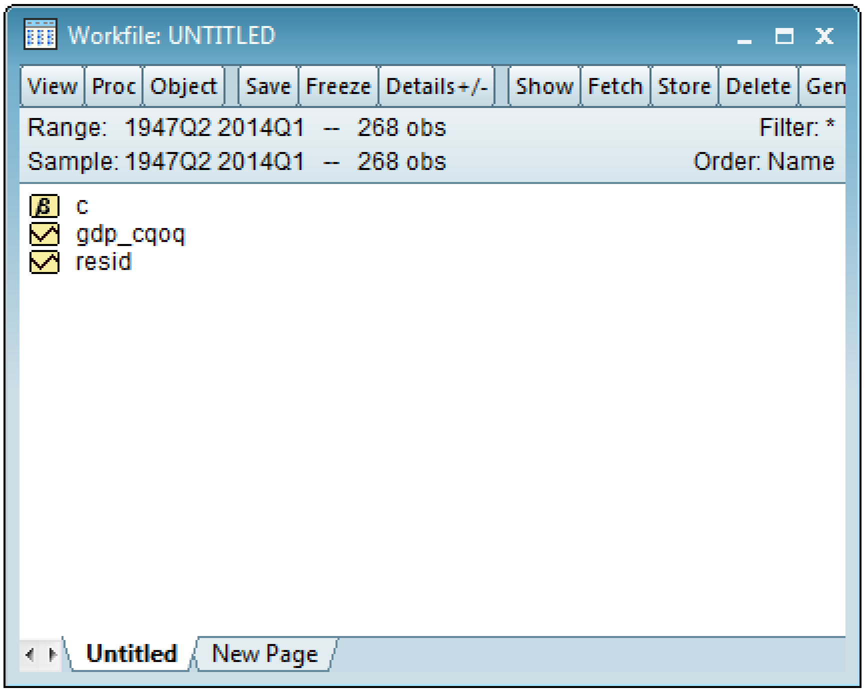


The information shows that this is a quarterly series beginning in 1947Q2 and ending in 2014Q1. Additional information (including a detailed description) is available by scrolling further down in the output. Note that you may configure the fields that appear in this summary. See Configuring Descriptive Information below for details.

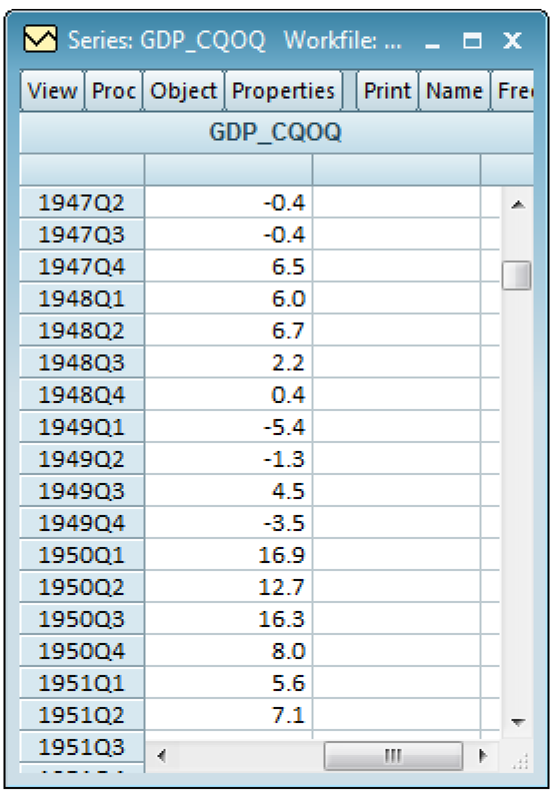
To fetch this series, click on the ‘Export to WF’ button or close the summary dialog then drag and drop the series “gdp cqoq index” into a blank part of the EViews frame. You will be prompted to rename the series so that it has a legal EViews object name:

By default EViews shortens the name by removing the market sector then replaces the space with an underscore to make the name legal. To accept this name, click on ‘OK’. To choose a different name for the object, simply type in a new name. You may remember the edited name so that it is used automatically the next time the series is fetched by clicking on ‘Add this name to the database alias list’.

After you click on OK, a workfile window should appear containing the downloaded object:



Double click on 'gdp_cqoq' to confirm that the data has been fetched correctly



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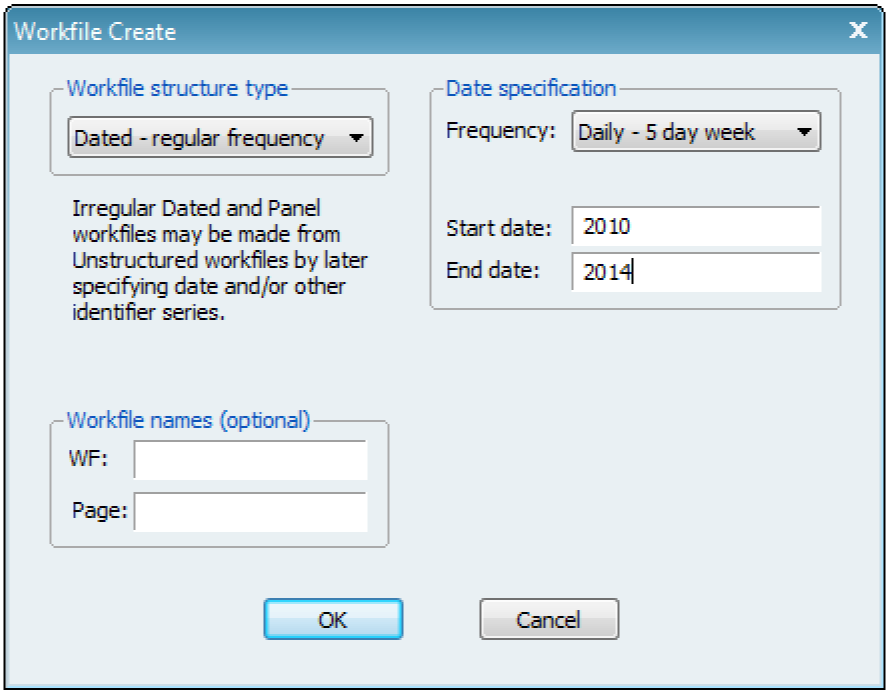
Note that some Bloomberg securities (including most market data) do not have start and end dates available as attributes of the series. In this case, you may be prompted by EViews to specify the frequency, start and end date over which you would like to fetch the data:



Note that you can import intraday data for many securities by simply selecting an intraday frequency for the destination EViews workfile. Note that Bloomberg only provides the most recent 140 days of intraday data, so no data values will be returned for observations outside this range.

Using Bloomberg Fields and Overrides

The general structure of data within Bloomberg is that all data is arranged within *securities*. Each security contains a set of one or more *fields*, each of which may represent either a time series or a simple static value. The contents of these fields can be further modified by one or more *override*s that may change the meaning and content of the field.

Up to this point we have been fetching data into EViews without specifying any field name or override information, instead relying on EViews to choose default values for these. By default, EViews fetches the field ‘PX_LAST’ from a security with no overrides applied. For economic data this will generally contain the time series that matches the description of the security and is typically what you would like to retrieve. For example, the PX_LAST field of the Bloomberg security “gdp cqoq index” contains the values for the quarter-on-quarter percent change of US GDP. For market data, this field will contain the closing price for the security which may not be the only piece of information about the security that you are interested in.

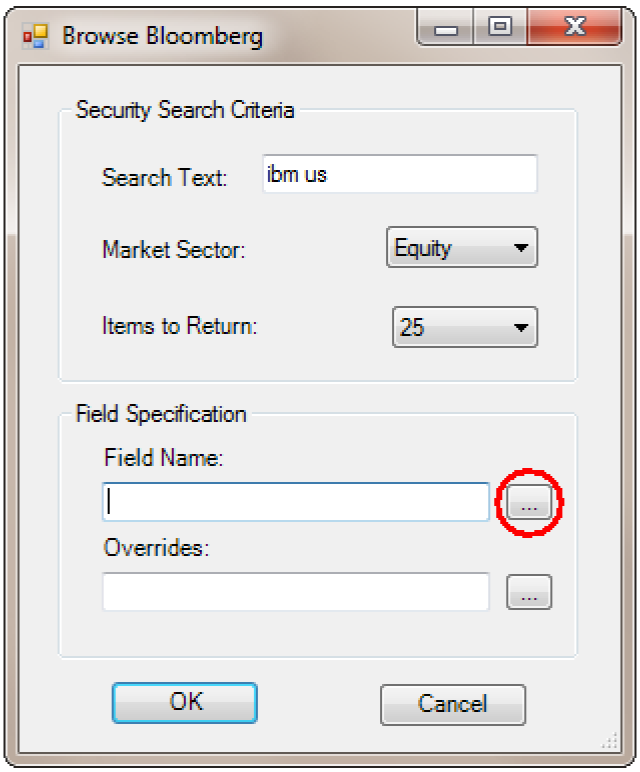
You may explicitly select a particular field and one or more override settings within EViews by appending them to the end of the security name. An example of a complete identifier within EViews that includes a field name and an override setting is:

```
"ibm us equity best_ebitda best_fperiod_override=FQ"
```

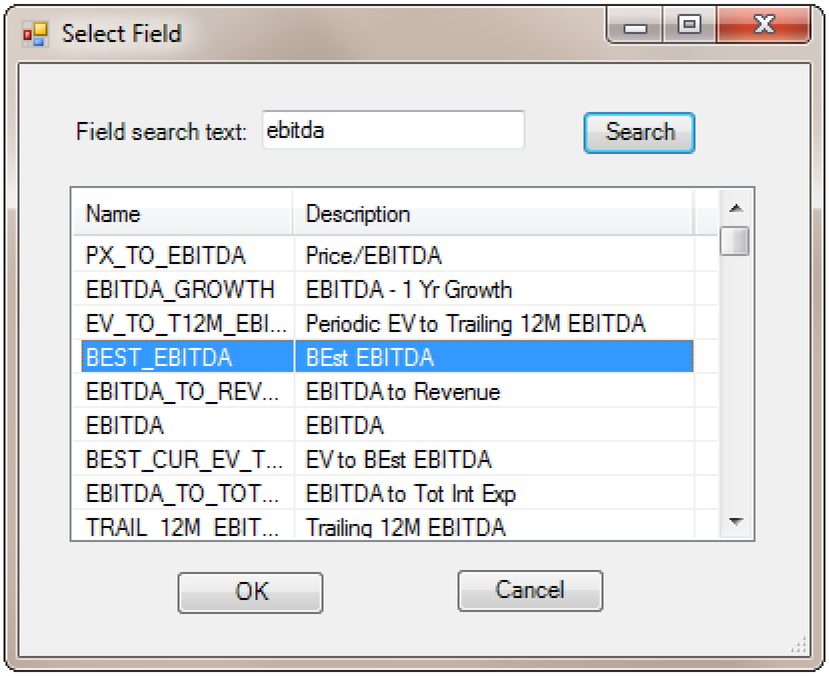
In this identifier, "Ibm us equity" is the security name (including the market sector 'equity'), "best_ebitda" is the field_name (the Bloomberg EBITDA estimate) and "best_fperiod_override=FQ " is an override setting (requesting that the period over which the ebitda estimates are calculated should be a fiscal quarter).

This entire identifier must be provided to EViews in order for EViews to understand that this is the particular time series you would like to fetch.

You may browse Bloomberg field names and overrides within EViews from within the 'Browse Bloomberg' dialog. First open the dialog by clicking on the 'Browse' button in the toolbar then enter the search text and market sector.



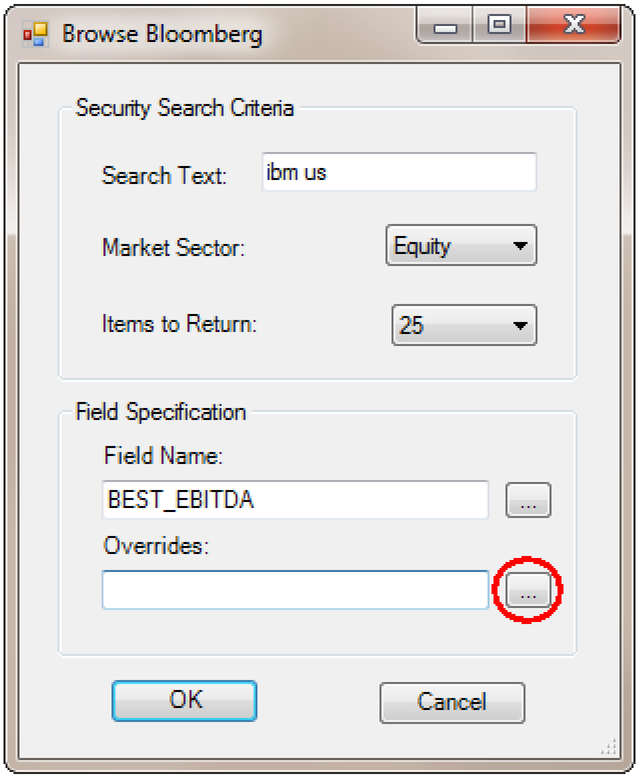
Click on the button to the right of the 'Field Name' text box to bring up the field selection dialog.



Within the field selection dialog, type one or more keywords into the 'Field search text' box then click on 'Search' to show a list of fields that match the keywords. Note that the list of fields will be filtered to only include fields available for the market sector you have selected in the Browse dialog.

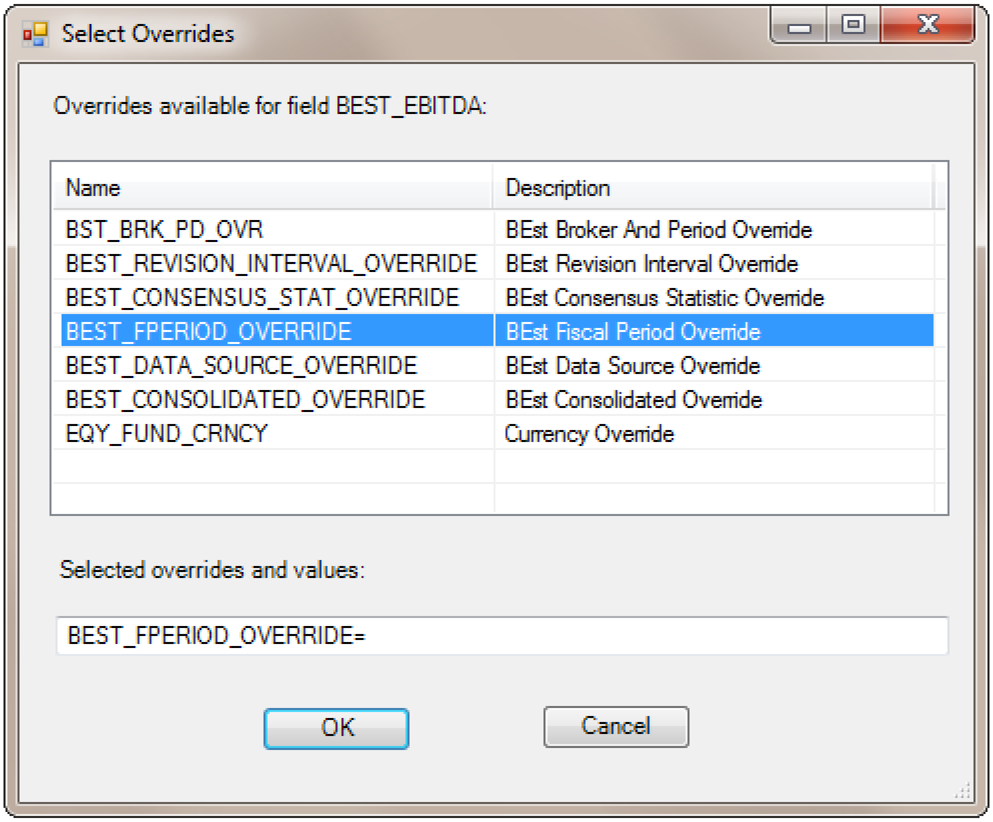
Holding your mouse over the name of any field will cause a flyover to appear with more information on the field. To select a field, simply double click the field or click once to highlight the field then click on OK.

To view the overrides available for the selected field, return to the browse dialog, then click on the button to the right of the 'Overrides' text box.



EViews will bring up the override selection dialog that shows all overrides available for the field. Again, you may hold your mouse over the override name to see additional information about the override.

Double click on an override to copy its name down into the 'Selected overrides and values' box.



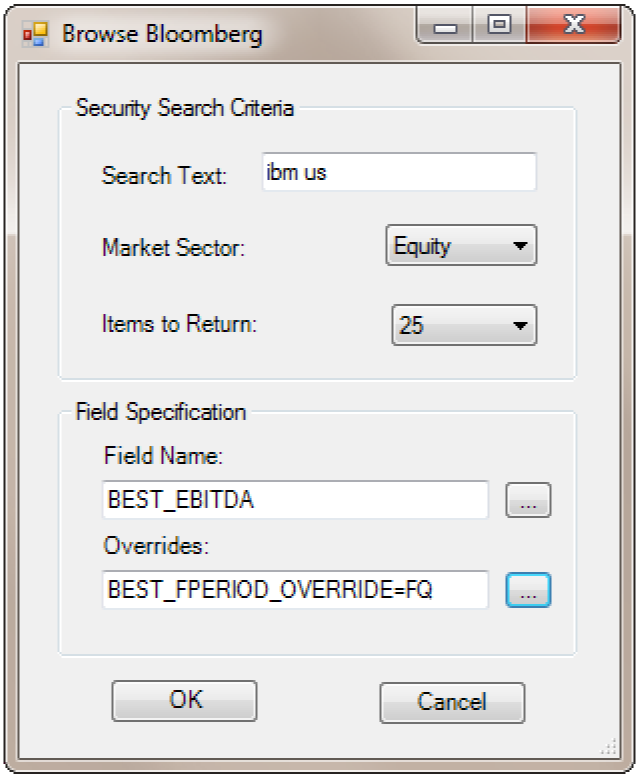
You will need to add the override value after the equals sign to complete the override setting. Information about the possible values of the override is generally available in the descriptive information that appears when you hold your mouse over the override name. You may also use the FLDS function within the Bloomberg terminal to obtain further information about Bloomberg fields and overrides.

Note that you can apply more than one override to a single field. In cases where more than one override is used they should follow the format:

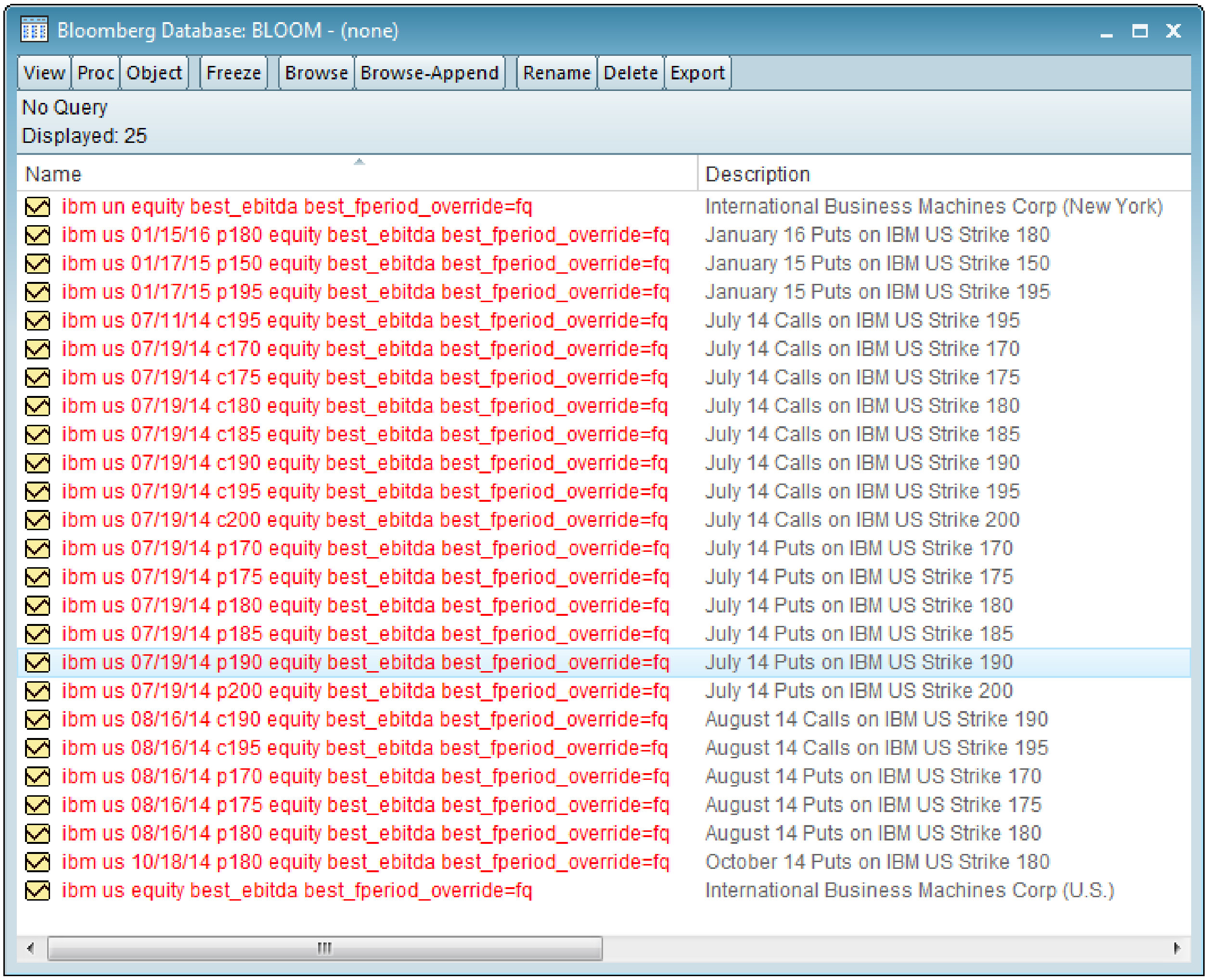
```
override1=value1 override2=value2 override3=value3
```

where each name/value pair is separated by an equals sign and each override is separated by a space.

Clicking on OK returns us to the Browse dialog with the override information copied into the Overrides text box:



Click on 'OK' to return the search results with the field name and overrides settings appended to the end of the security names:



You can then drag and drop any of these series into EViews to retrieve data taking into account the specified field and override settings (provided they are available for that security).

Note that a series object in EViews can contain only a single time series (although it may also contain a set of scalar values held in custom attributes). Consequently, to fetch more than one time series field from a Bloomberg security into an EViews workfile you will need to fetch the data into multiple EViews series objects and use different object names within EViews to distinguish the different field or override settings.

Refreshing Data with Links

So far the series we have created have contained a simple static snapshot of the data available in Bloomberg at the time the data was fetched. EViews also provides the ability to create series objects within an EViews workfile that are linked to the data within the external database and can be refreshed to contain the latest data whenever required.

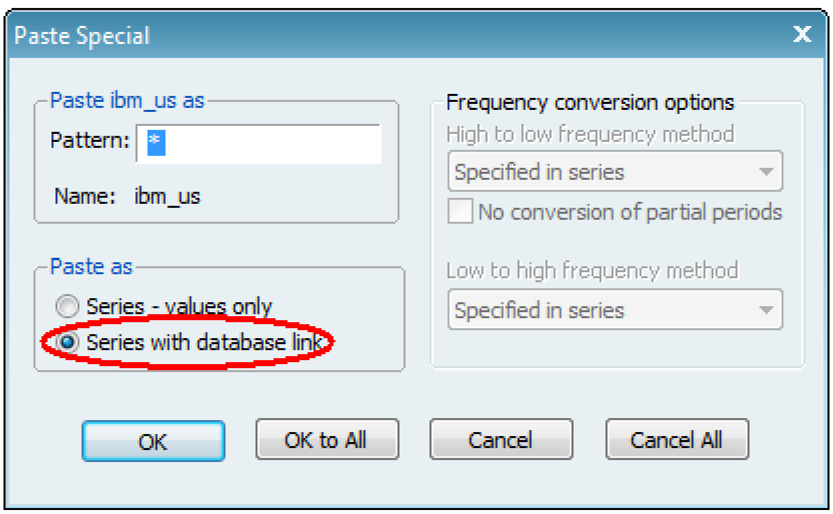
Creating a linked series within EViews follows almost the same steps as performing a simple one time fetch.

The first step is to find the data within Bloomberg that you would like to retrieve. This follows exactly the same steps as in the unlinked case above.

The second step is to choose a destination workfile for your linked series. If you already have an existing EViews workfile into which you would like to fetch the Bloomberg data, simply open that workfile in EViews so that the workfile window is displayed. If you do not have an existing workfile, you should create a new empty workfile using the menu item File…New… Workfile. Enter the frequency, start and end date of the workfile you would like to create then click on OK.

To create a series linked to Bloomberg data, click on the series within the Bloomberg database window and then either use the **right** mouse button to drag-and-drop the series from the database into the destination workfile or select 'Copy' from the right mouse button menu, move the mouse to the destination workfile and choose 'Paste Special' from the right mouse button menu.

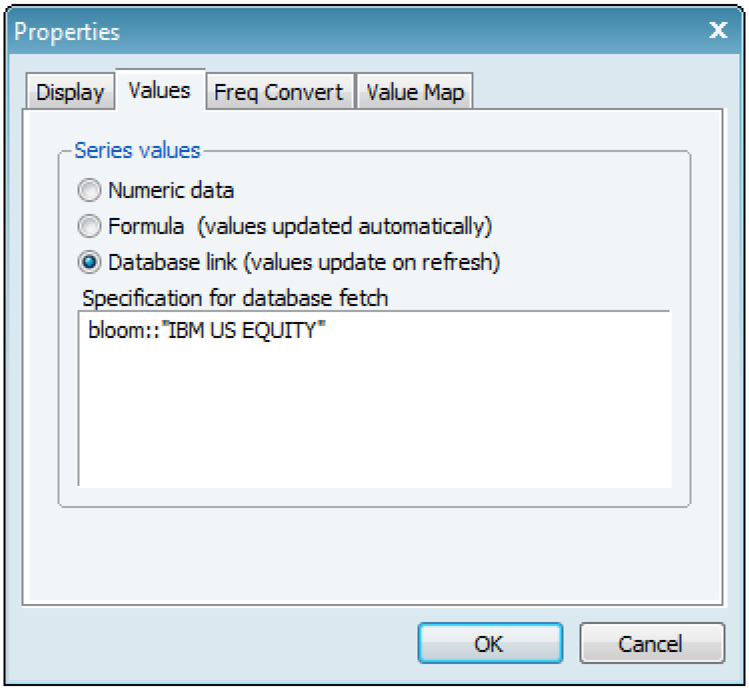
The EViews 'Paste Special' dialog should appear:



Make sure the 'Paste as' option is set to: 'Series with Database Link', then click on OK.

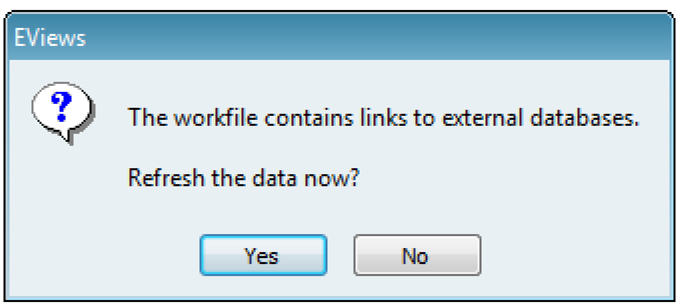
A new object should appear in the workfile window that represents the linked series object. The series icon should appear in pink to indicate that the series data is linked.

You can verify that the link information has been correctly configured within the series by double clicking on the series object in the workfile window to open it. Click on the 'Properties' button in the toolbar, then select the 'Values' tab. You should see a property page similar to this:



In this example, 'bloom' is the name of the Bloomberg database and "ibm us equity" is the identifier of the series within Bloomberg that has been linked to. You can edit this identifier to link to a different series or add a field name or an override setting if necessary.

A linked series differs from an ordinary EViews series in that it cannot be edited by hand and that each time the workfile is opened you will see a prompt:



Clicking on 'Yes' causes EViews to fetch the latest data values from Bloomberg.

To see what series have been updated and examine which values have changed, click on 'View…Compare…' from the workfile menu and click on 'OK' to compare the contents of the workfile after the update with the copy of the workfile saved on disk. EViews will display a list of changes (if any) so that you can confirm that the updates have proceeded as expected.

Refreshing Data with Batch Programming

In addition to its interactive interface, EViews also supports a command line interface for working with databases. This command line interface can be used to create batch programs to carry out repetitive tasks. The Bloomberg database extension enables all EViews commands and procedures for working with databases to also apply to working with Bloomberg data.

A simple program for fetching Bloomberg data into a workfile might look like this:

```
create q 1950 2020
dbopen(type=bloom) index
fetch "gdp cqoq"
```

The first line creates an empty EViews workfile (quarterly frequency, starting in 1960 ending in 2020). The second line opens a Bloomberg database window (with the default market sector set to 'index'). The third line fetches the PX_LAST field of the security "gdp cqoq index" into the workfile. Note that EViews will automatically adjust any illegal name of an incoming object so that it becomes a legal EViews object name, so the final series in the workfile will be named GDQ_CQOQ.

Note that Bloomberg identifiers containing spaces will need to be surrounded by double quotes so that EViews does not treat spaces within the identifier as dividers between multiple object names.

You can fetch multiple series within one fetch command by simply listing them all on the one line:

```
fetch "ibm us equity" "msft us equity"
```

To specify an explicit Bloomberg field or an override setting, simply add the extra information at the end of the identifier used in the fetch command. For example, the command:

```
fetch "ibm us equity best_ebitda best_fperiod_override=FQ"
```

will fetch the best_ebitda field with the override best_fperiod_override set to the value FQ.

You can rename a series during the fetch using the 'copy' command. This is useful when working with long identifiers where automatic name truncation will occur if the series is not renamed. For example, we can fetch the advance, preliminary and final estimates for US gdp using the following set of copy commands:

```
create q 2000 2020
dbopen(type=bloom) index
copy index::"gdp cqoq release_stage_override=a" gdp_advance
copy index::"gdp cqoq release_stage_override=p" gdp_prelim
copy index::"gdp cqoq release_stage_override=f" gdp_final
```

The series created in the workfile will be named gdp_advance, gdp_prelim and gdp_final.

Note that you can also make use of EViews ability to manipulate strings to build up Bloomberg identifiers. Here is an example of how you would apply the same field name and override settings to several securities at once:

```
create q 1950 2020
dbopen(type=bloom) equity
```

```
%securities = "ibm msft goog"
%suffix = """us equity best_ebitda best_fperiod_override=FQ"""
%idlist = @wcross(%securities, %suffix, "? ?")
fetch {%idlist}
```

The fetch command in this program performs the same operation as issuing the following three commands:

```
fetch "ibm us equity best_ebitda best_fperiod_override=FQ"
fetch "msft us equity best_ebitda best_fperiod_override=FQ"
fetch "goog us equity best_ebitda best_fperiod_override=FQ"
```

However, the program can easily be modified to fetch information for additional securities or to use different field or override settings.

The main string manipulation function used in this example is the @wcross() function. This function takes each 'word' (space delimited item) within its first argument and combines it with each word within its second argument using the pattern specified in the third argument to join the two parts together. Note the use of repeated double quote pairs within the %suffix string to indicate double quote characters inside the string. These double quotes are necessary since otherwise EViews would treat each word within suffix ('us' 'equity' etc.) as a separate item within the cross operation.

An alternative approach is to use the looping features provided within EViews programs to execute a set of commands repeatedly. For example, we could use a 'for' loop over a set of string values and the copy command to make a version of the program that renames the series that we are fetching:

```
create q 1950 2020
create q 1950 2020
dbopen(type=bloom) equity
%securities = "ibm msft goog"
%suffix = " us equity best_ebitda best_fperiod_override=FQ"
for %security {%securities}
    %id = %security + %suffix
    copy bloom::%id {%security}_ebitda
next
```

The same series are created in the workfile by this program as for the previous example, but they will be named ibm_ebitda, msft_ebitda, and goog_ebitda.

Additional Options and Intraday Fields

There are a number of additional options that can be specified during a request for Bloomberg data which are not strictly considered overrides by the Bloomberg Open API (they will not be returned by the override search functionality) but they operate in a very similar manner, modifying the data values returned by Bloomberg for the requested field.

EViews treats these options identically to overrides allowing them to be included at the end of an identifier in the format “option_name=option_value”. This matches up with similar handling of these options within Excel by the Bloomberg Excel Add-in functions such as BDH().

The following table contains a list of these additional options. You may consult the Bloomberg Excel documentation for details about their meaning and usage.

OPTION NAME	OPTION VALUE
Fx, Curr or Currency	Bloomberg currency code
UseDPDF	Y/N
CshAdjNormal	Y/N
CshAdjAbnormal	Y/N
CapChg	Y/N
Quote	C, Close / A, G, Average
QuoteType, QtTyp	Y,Yield / P, Price

For example, by default Bloomberg adjusts the price data for a security to account for stock splits. To let Bloomberg know that you would like to fetch unadjusted values, you can add capchg=n to the end of the identifier within EViews. For example, to fetch Apple’s stock price unadjusted for splits, you could use the EViews command:

```
fetch "aapl us equity capchg=n"
```

Similarly, when working with intraday data, EViews supports a number of ‘artificial’ field names that can be used to select different summary information to be returned for each intraday interval. These are handled the same as regular Bloomberg field names within EViews. The following table contains the different fields available for intraday data.

Close or PX_CLOSE
Open or PX_OPEN
High or PX_HIGH
Low or PX_LOW
NumEvents or TickCount
Volume or PX_VOLUME
Value

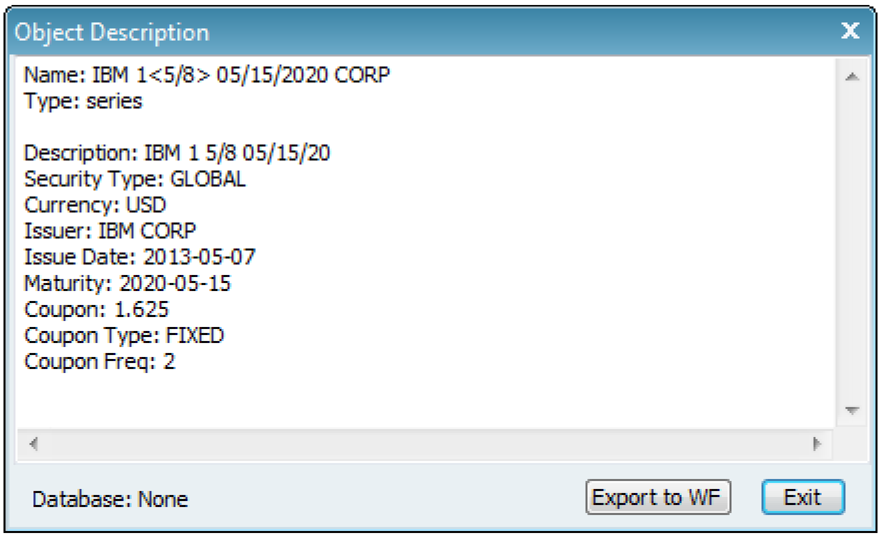
By default, EViews returns the closing price of the security for each interval. You can add an explicit field name to the end of the identifier to override this behavior. For example, to fetch the volume of IBM’s shares traded, you could enter the EViews command:

```
fetch "ibm us equity volume"
```

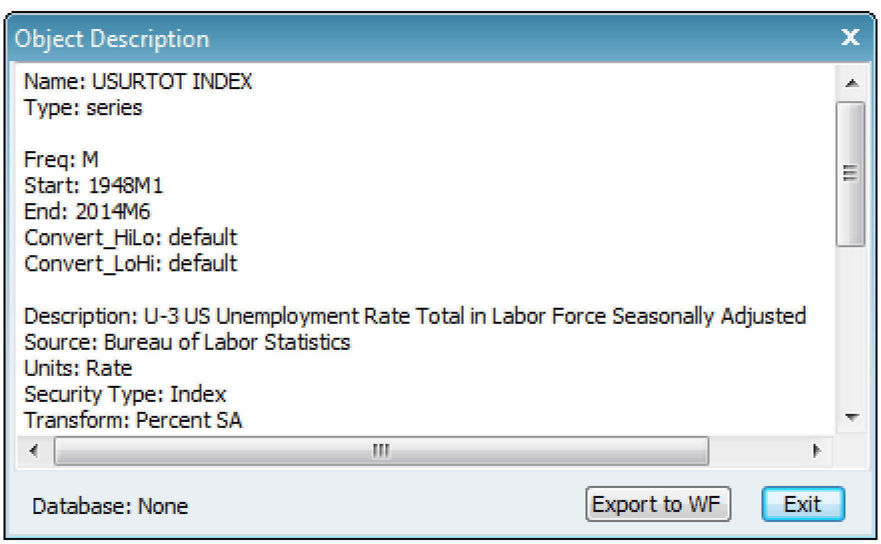
Configuring descriptive information

Each Bloomberg security can contain many data fields. Many of these fields represent historical time series, and these fields will typically be retrieved into the observation values of an EViews series object. In addition to these time series fields, Bloomberg securities also contain many descriptive fields that help clarify the definition of the security and assist in its usage.

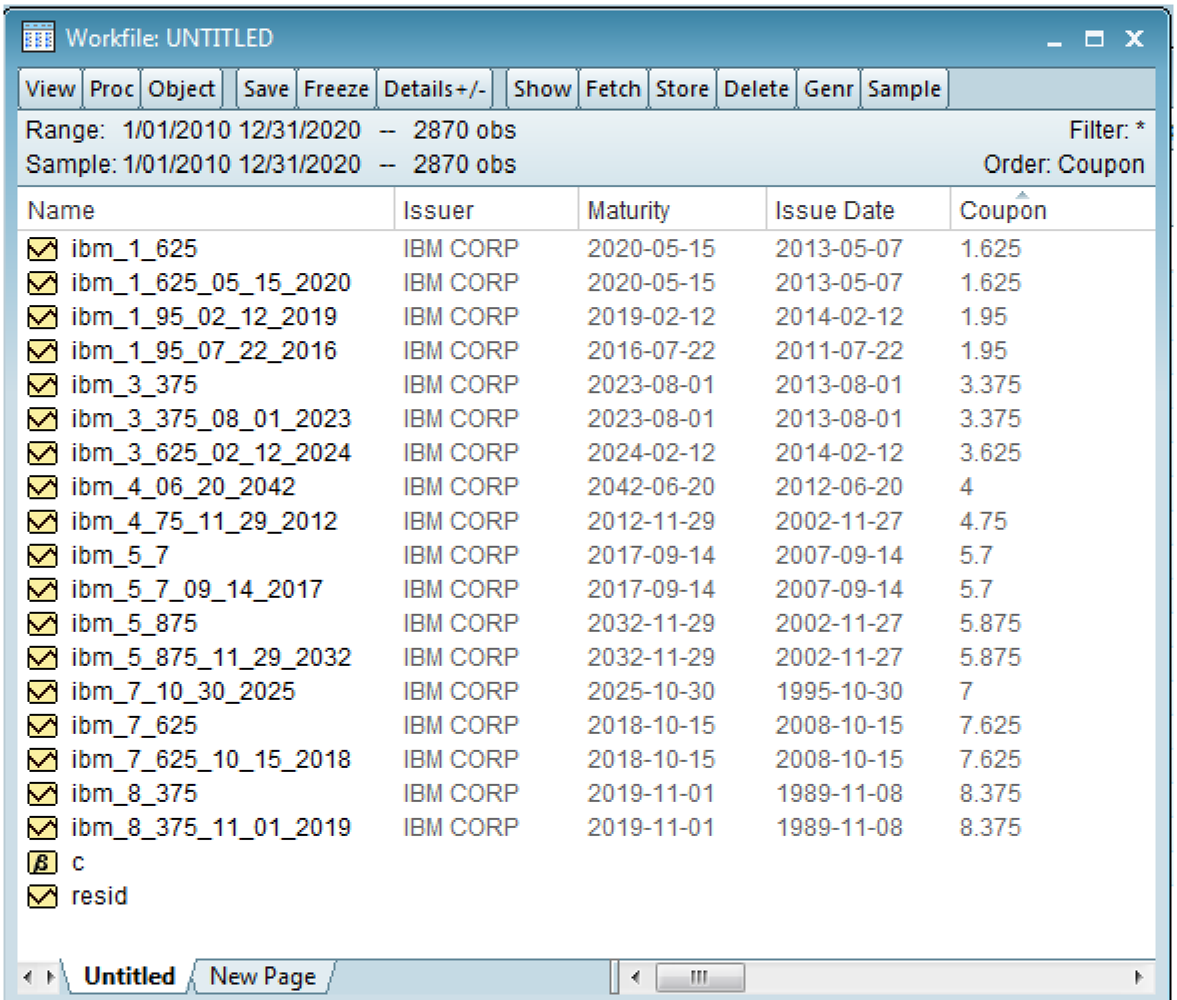
You can see an example of additional descriptive field information by double clicking on any search result in the Bloomberg database window. For example, clicking on the bond “IBM 1<5/8> 05/15/2020 CORP” produces the following descriptive information.



The descriptive information displayed depends on the market sector of the Bloomberg security. For example, clicking on the index “USURTOT INDEX” produces a different set of descriptive information:

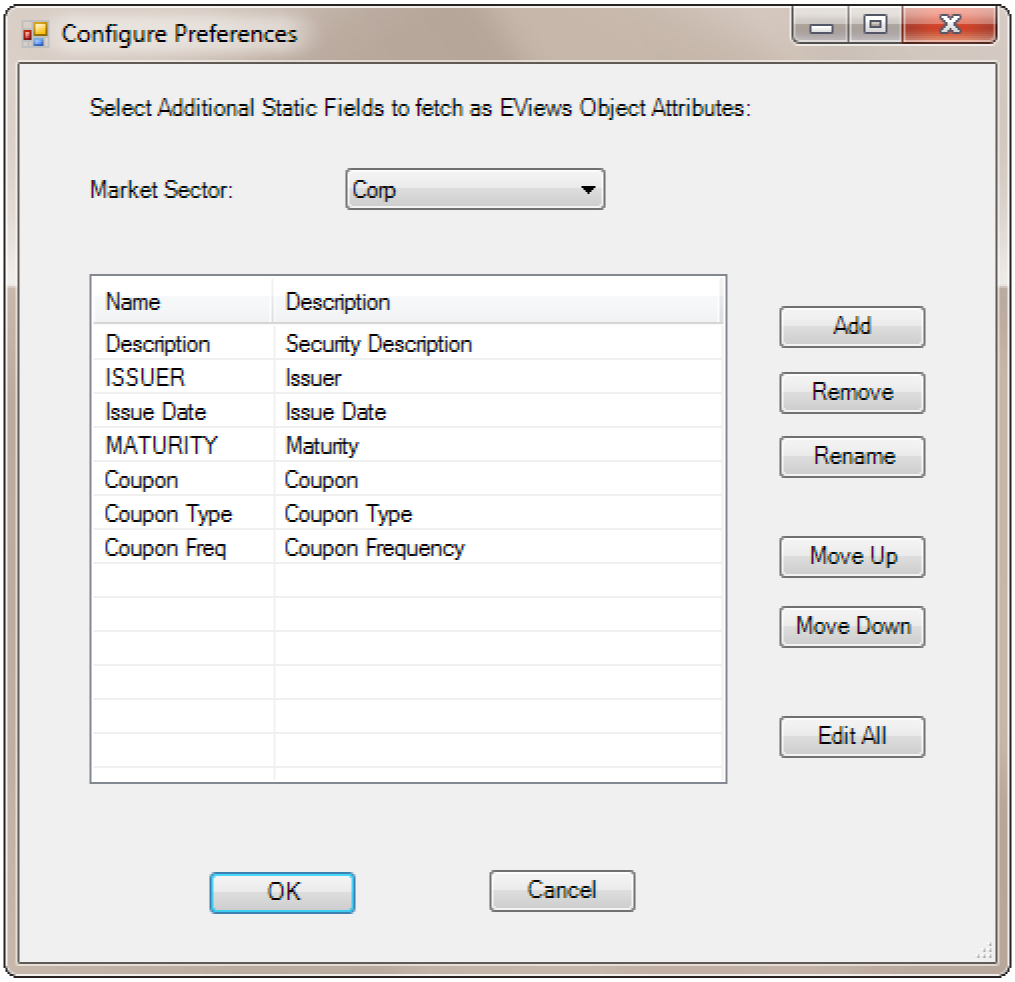


As well as being displayed in the search results, this additional descriptive information is also imported into EViews whenever a series is fetched. The additional descriptive fields from the security are stored in the custom attributes of an EViews object. Custom attributes are a feature within EViews that allow you to keep additional information within an EViews object that can be viewed at any time using the 'Label' view of an object. Attribute values can also be displayed across all objects in a workfile using the 'Details' view of the workfile window. Here is an example of a workfile window displaying descriptive information for bond data fetched from Bloomberg:



Name	Issuer	Maturity	Issue Date	Coupon
ibm_1_625	IBM CORP	2020-05-15	2013-05-07	1.625
ibm_1_625_05_15_2020	IBM CORP	2020-05-15	2013-05-07	1.625
ibm_1_95_02_12_2019	IBM CORP	2019-02-12	2014-02-12	1.95
ibm_1_95_07_22_2016	IBM CORP	2016-07-22	2011-07-22	1.95
ibm_3_375	IBM CORP	2023-08-01	2013-08-01	3.375
ibm_3_375_08_01_2023	IBM CORP	2023-08-01	2013-08-01	3.375
ibm_3_625_02_12_2024	IBM CORP	2024-02-12	2014-02-12	3.625
ibm_4_06_20_2042	IBM CORP	2042-06-20	2012-06-20	4
ibm_4_75_11_29_2012	IBM CORP	2012-11-29	2002-11-27	4.75
ibm_5_7	IBM CORP	2017-09-14	2007-09-14	5.7
ibm_5_7_09_14_2017	IBM CORP	2017-09-14	2007-09-14	5.7
ibm_5_875	IBM CORP	2032-11-29	2002-11-27	5.875
ibm_5_875_11_29_2032	IBM CORP	2032-11-29	2002-11-27	5.875
ibm_7_10_30_2025	IBM CORP	2025-10-30	1995-10-30	7
ibm_7_625	IBM CORP	2018-10-15	2008-10-15	7.625
ibm_7_625_10_15_2018	IBM CORP	2018-10-15	2008-10-15	7.625
ibm_8_375	IBM CORP	2019-11-01	1989-11-08	8.375
ibm_8_375_11_01_2019	IBM CORP	2019-11-01	1989-11-08	8.375
c				
resid				

You may configure the set of descriptive fields that EViews fetches for a Bloomberg security by selecting the 'View… Preferences' menu item from the Bloomberg database window toolbar. The Configure Preferences dialog will appear:

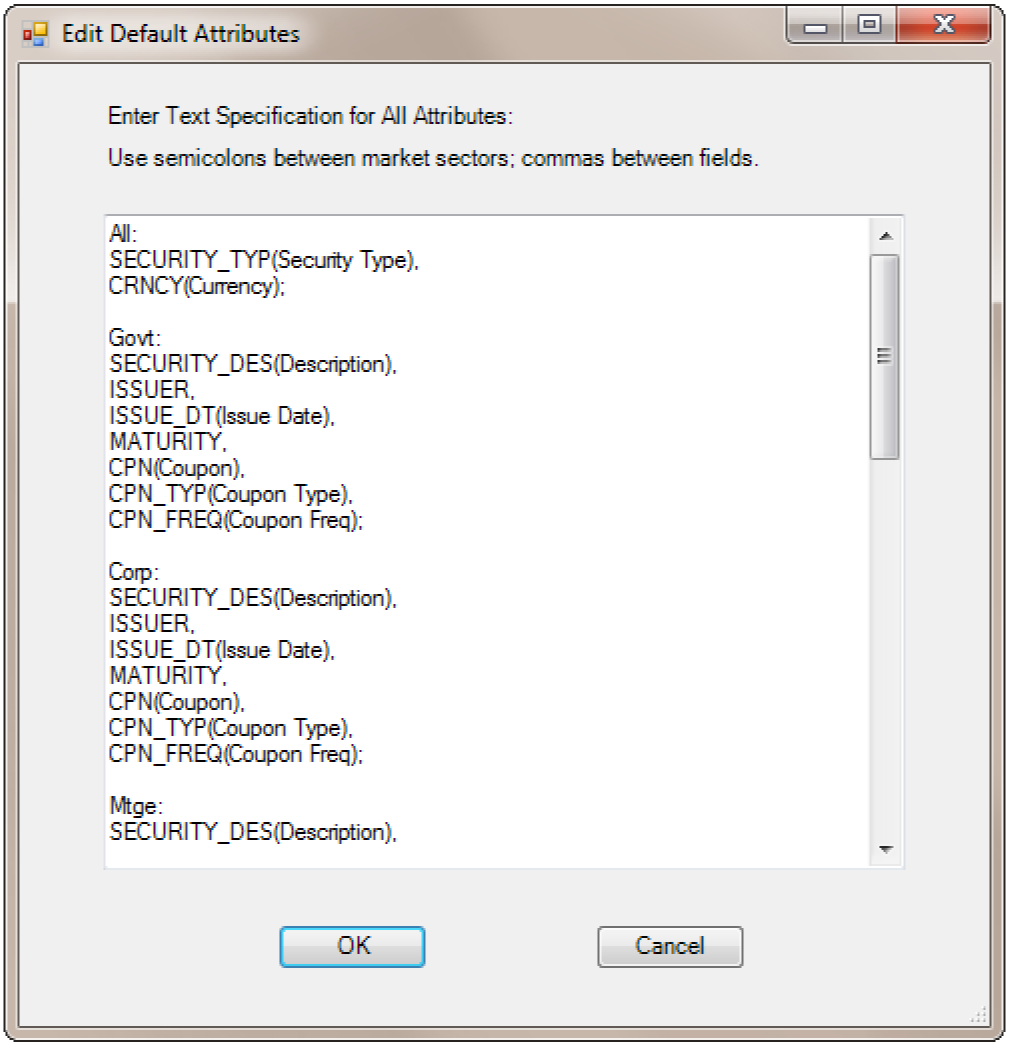


The dialog allows you to select the descriptive fields you would like to fetch for securities within each Bloomberg market sector (yellow key). To add a descriptive field for every market sector, choose 'All' from the market sector dropdown.

Click on 'Add' to add a field. The Select Field dialog will appear. This is the same dialog that appears when searching for field names within the Browse dialog which we discuss above. Note that when you add a new field, it will initially be included using the same name as the Bloomberg field name. You may rename the field (using the 'Rename' button) if you would like the EViews attribute containing the field to use a different name.

You may remove fields using the 'Remove' button and rearrange the order of fields using the 'Move Up' and 'Move Down' buttons.

The 'Edit All' button can be used to bring up a page containing a text representation of all your current descriptive field preferences. The representation lists each market sector in turn showing a list of Bloomberg field names to be fetched within the market sector. Attributes that have been renamed will have the new name appear within parentheses after the Bloomberg field name.



Note that these preference settings are specific to the current user on the current machine and are saved within the current user's EViews ini file. If you would like to share your configuration with another user or move your current configuration onto another machine, simply copy and paste your preference settings within the 'Edit All' view.

Working with ambiguous security names

The Bloomberg system supports a variety of different naming schemes for referring to securities. The most commonly used identifiers are human readable identifiers such as:

```
ibm 0<3/4> 05/11/2015 corp
```

for the corporate bond issued by IBM with coupon rate .75% and maturity date 05/11/2015. This is also the form of identifier that is returned in the results of the Bloomberg security search functionality.

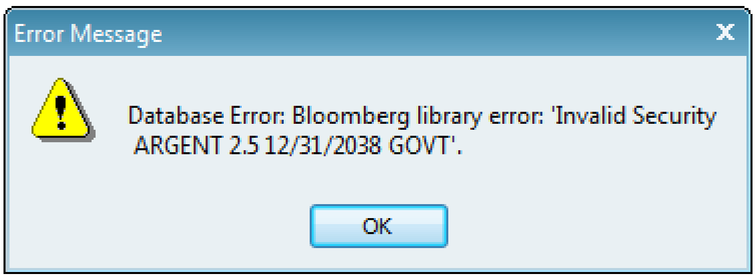
The same security can also be identified using a number of other identification schemes, including the "Bloomberg Global Identifier", which for this security has the form:

```
BBG002Z0BHZ8
```

In most cases either naming convention can be used inside EViews to identify the series. However, in some cases the human readable identifier is ambiguous and EViews will not be able to fetch data using this identifier. For example, the search results for the keyword ‘argent’ within the ‘govt’ market sector include the government bond:

```
argent 2<1/2> 12/31/2038
```

However, if you double click on this search result or try to fetch the series into an EViews workfile you will see an error



The problem being reported here is that there is more than one bond in existence that has the same issuer, coupon and maturity. Typical reasons for this include that the bond has been issued in more than one currency (such as USD and Euro) or because it has been issued under more than one regulatory regime.

The only way to resolve this problem is to fetch the bond using a different type of identifier that is guaranteed to be unique (such as the Bloomberg Global Identifier). Unfortunately, there is no way to find the value of this identifier from within EViews. You will have to use the Bloomberg Terminal to examine why the security identifier is ambiguous in these cases and to find another unique identifier for the particular bond you are interested in working with.

Limitations

Note that EViews does not currently support reading tick data for a security. The highest resolution of data that can be fetched by EViews is one minute interval data.