EViews Training

Data Objects Basics: Series and Groups

Note: Data and workfiles for this tutorial are provided in:

- Data: ***Data.xls***
- Results: ***Results.wf1***
- Practice Workfile: ***Data.wf1***

Data Series Objects: Series and Groups

- **Series** and **Groups** are the most important Data Objects in Eviews.
- The actual numeric values of your data are held in the **Series** Object.
- A collection of Series (multiple data columns) comprises a Group Object.
- This tutorial demonstrates basic work with **Series** and **Groups:**
  - ✓ Creating a Series
  - ✓ Bringing data into EViews
  - ✓ Creating New Series from Existing Series
  - ✓ Creating AutoSeries
  - ✓ Handling Missing Observations
  - ✓ Editing, documenting and displaying a Series
  - ✓ Creating Groups and working with Groups

Data and Workfile Documentation

- ***Data.wf1*** and ***Data.xlsx*** have a number of pages (tabs) with the following data:

- Workfile Page: *Timeseries* (Data.xlsx tab *Timeseries*):
  quarterly, Q1 1980 – Q1 2012
  - ✓ GDP – real GDP data (billions of dollars) from the Bureau of Economic Analysis.
    - ✓ GDP_revised and GDP_revised1 – real GDP data; slightly changed from original series.
  - ✓ PCE – real consumption data (billions of dollars) from the Bureau of Economic Analysis.
  - ✓ Inv – real private sector investments (billions of dollars) from the Bureau of Economic Analysis.
  - ✓ G – real government spending (billions of dollars) from the Bureau of Economic Analysis.
  - ✓ Trend – it's a trend series, starting with 1 and growing over time.
  - ✓ Edit_series – a simple series with a few initial values.
  - ✓ S- a series with only one initial value.

- Workfile Page: *Missing_Example1* (Data.xlsx tab *Missing_Example1*):
  quarterly, Q1 1980 – Q1 2012
  - ✓ Inv – real private sector investments (billions of dollars) from the Bureau of Economic Analysis.
    - ✓ Missing data coded as "none"

Data and Workfile Documentation (cont'd)

- Workfile Page: *Missing_Example2* (Data.xlsx tab *Missing_Example2*):
  quarterly, Q1 1980 – Q1 2012
  - ✓ Inv – real private sector investments (billions of dollars) from the Bureau of Economic Analysis.
    - ✓ Missing data coded as "0"

- Workfile Page: *Missing_Example3* (Data.xlsx tab *Missing_Example3*):
  quarterly, Q1 1980 – Q1 2012
  - ✓ Inv – real private sector investments (billions of dollars) from the Bureau of Economic Analysis.
    - ✓ Missing data coded as "-999", "-99", and "-9".

- Workfile Page: *Missing_Regression* (Data.xlsx tab *Missing_Regression*):
  quarterly, Q1 1980 – Q1 2012
  - ✓ GDP – real GDP data (billions of dollars) from the Bureau of Economic Analysis.
  - ✓ Inv – real private sector investments (billions of dollars) from the Bureau of Economic Analysis.
    - ✓ Missing data coded as "NA"

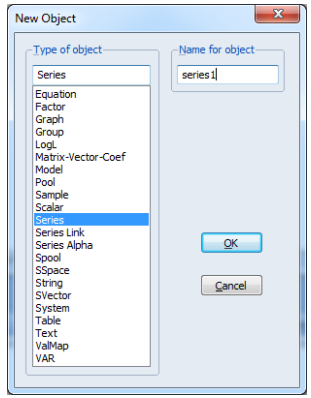
Creating a New Series

Creating a New Series: Example 1

- There are a number of ways to create a new (empty) series in EViews.

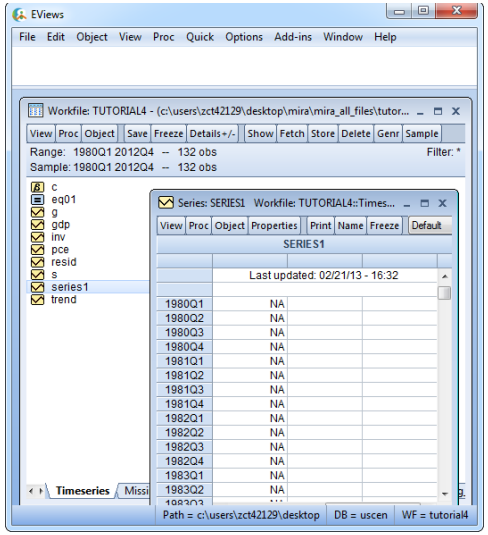
Creating a series: Example 1

1. Click on page named ***Timeseries*** in *tutorial4.wf1.*
2. Select **Object → New Object** from the main menu.
3. Click the **Series** option, name it (in this case s*eries1*).
4. Click **OK**.



Creating a New Series: Example 1 (cont'd)

- The new series has the structure of the workfile and **NA** in all entries.



Creating a New Series: Example 2

- Another way to create a series is through the command window.

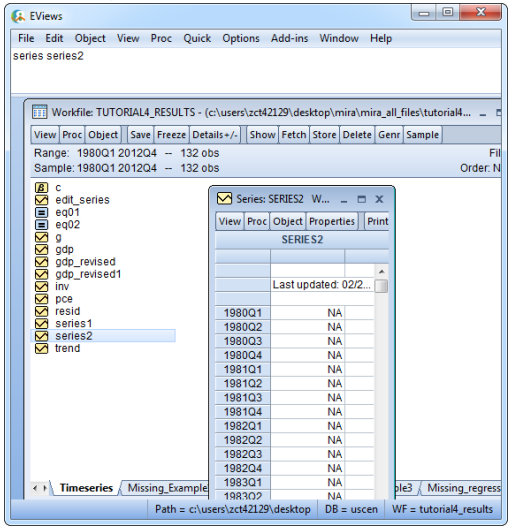
Creating a series : Example 2

1. On the command window type:

   series series2

   Note: This instructs EViews to create a new series and name it newseries.
2. Press **Enter.**
3. Locate the new series (*series2*) in the workfile and open it**.**

- The result is the new series (*series2*), which has the structure of the workfile and **NA** in all entries.

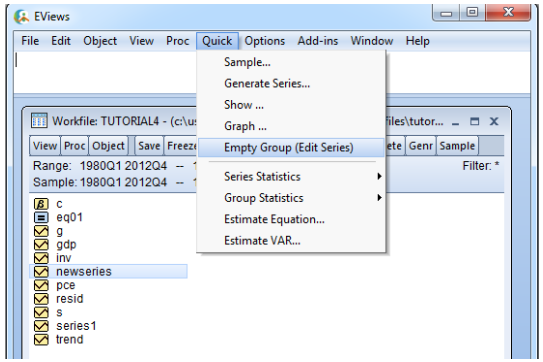


Creating a New Series: Example 3

- You can also use **Quick** menu items to create a series.

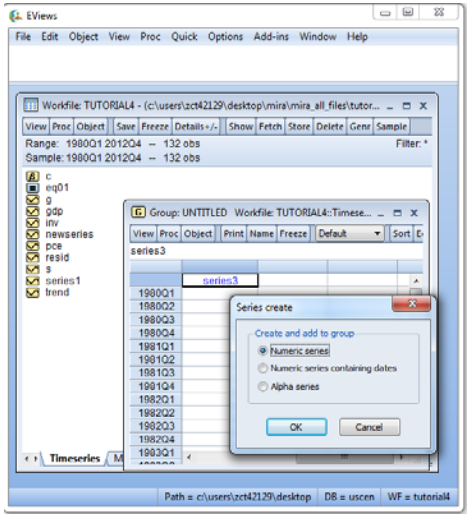
Creating a series: Example 3

1. Click **Quick** → **Empty Group (Edit Series)** from the menu toolbar.



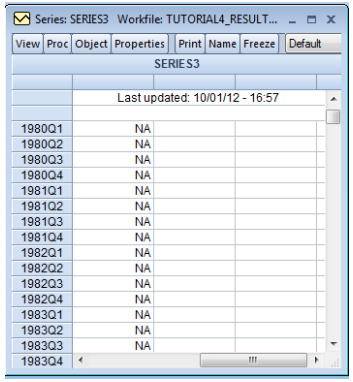
Creating a New Series: Example 3 (cont'd)

2. A window opens up with a blank spreadsheet and dates on the side.
3. Scroll up one line (to the top of the spreadsheet) and type the name of the series (*series2* here).
4. Click **Enter.** The "***Series create***" dialog box opens up so you can specify the type of series.
5. Pick "**numeric series**" if the series you are creating will be filled with numeric values.
6. Click **OK**.



Creating a New Series: Example 3 (cont'd)

7. Close the untitled group (EViews asks if you would like to delete Untitled group; click Yes).
8. Locate "*series3*" in the workfile and open it.
9. The new series "series3" has the structure of the workfile and NA in all entries.



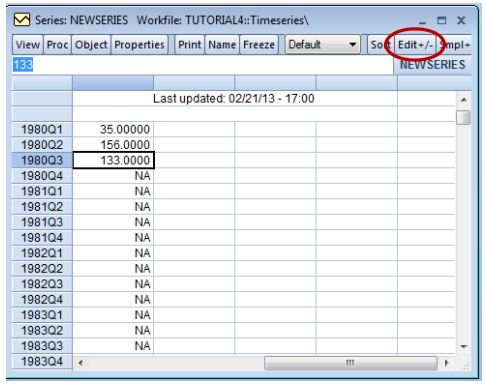
Bringing Data into EViews

Getting Data into an Existing Workfile: Example 1

- For small data series, you may wish to type in the data (see also *Editing Series* below).

Typing data in a series:

1. Click on page *Timeseries* and open one of the new series with empty (**NA**) values we created above. For this example, let's click on "*series2*".
2. Click the Edit+/- button to turn on editing mode (note: using **Edit +/-** depends on your option settings; it is needed under default settings).
3. Start entering in data.



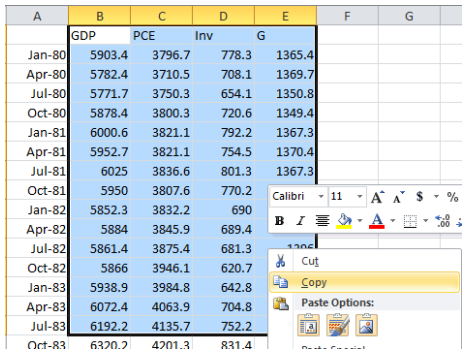
Note: This method is not practical when dealing with large datasets.

Getting Data into an Existing Workfile: Example 2

- An easy way to bring data into an existing EViews workfile is by copy/paste

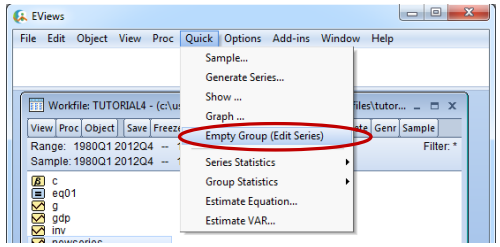
Bringing data in EViews by Copy/Paste:

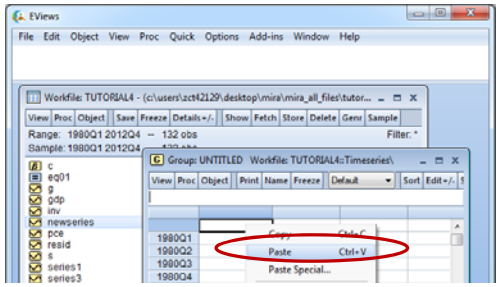
1. Open the data in Excel® (**Note**: this also applies to other applications). Click on tab *TimeSeries in* the ***Tutorial4_Data.xlsx*** file.
2. Highlight the series you wish to bring into EViews and select **Edit → Copy** (Note: you do not need to copy dates since the EViews workfile is already structured by date).



Getting Data into an Existing Workfile: Example 2 (cont'd)

3. In EViews workfile click **Quick → Empty Group (Edit Series).**
4. A window opens up with a blank spreadsheet and dates on the side. Place the cursor on the upper-left cell, right-hand-click, and choose **Paste**.



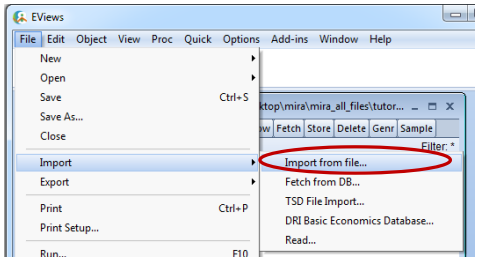


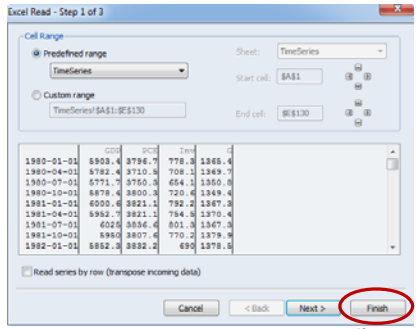
Getting Data into an Existing Workfile: Example 3

- Another way to bring data into an existing EViews workfile is by importing data from foreign files.

Importing data into a workfile:

1. On the menu bar, select **File** (or **Proc**) → **Import**→ **Import from file.** A standard **File Open** dialog box appears which allows you to locate the file.
2. Click **Open** once you locate the file. The **Excel Read** dialog box opens up prompting for additional information for the import procedure.
3. Click **Finish** to load the data.





Getting Data into EViews: A few notes

- The easiest way to get data from a *single source* into Eviews is by using **File → Open → Foreign Data as Workfile** (see Tutorial on *Creating Workfiles* for more details).
- One main difference between **Open Foreign Data as Workfile** and **Import** is that the first method brings in the data while at the same time creating a new workfile, while **Import** brings data into an existing workfile.
- If the data comes from various sources (files), it is perhaps best to follow these steps to bring data into EViews:
  1. Use **File → Open → Foreign Data as Workfile** for the more complex or the largest files. This also creates a new workfile with a similar structure as the source data file.
  2. Use **File → Import** or **Copy/Paste** (as shown in the previous two examples) to add data from other sources into the main workfile. Please note, that the data in all files should have the same structure (i.e., monthly, quarterly, etc.).

Creating New Series from Existing Series

Creating a New Series by Transforming an Existing series: Example 1

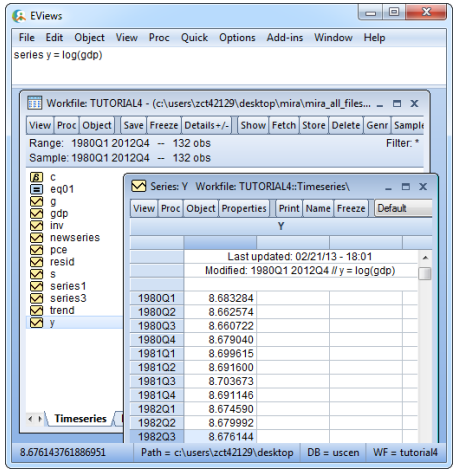
- You can also create a series by transforming an existing series.
- For example, suppose you would like to create a series y=log(gdp).

Creating a series by transforming an existing series: Example 1

1. Click on the ***Timeseries*** page on *Tutorial4.wf1*.
2. In the command window, type:
   series *y = log(gdp)*
2. Press the **Enter** key.

Note: in EViews, log(x) is the natural logarithm (not of base 10).

Note: an alternative way to create a series is to type ***genr y= log(gdp)*** in the command window.



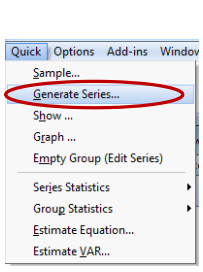
Creating a New Series by Transforming an Existing series: Example 2

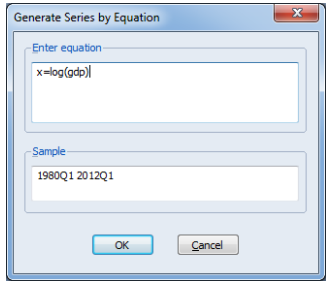
- Another way to create a series from an existing series is from the **Quick** menu:

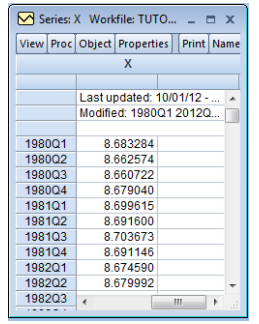
Creating a series by transforming an existing series: Example 2

1. On the *Timeseries* page, click **Quick → Generate Series** from the menu toolbar.
2. The window ***Generate Series by Equation*** opens. Type your data transformation here (in this case, ***x=log(gdp***)).
3. Click **OK.**

- Note that the new series x has the structure of the transformed series.







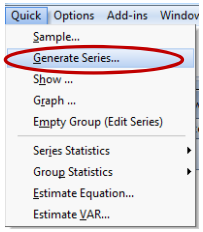
Creating a New Series by Transforming an Existing series: Example 3

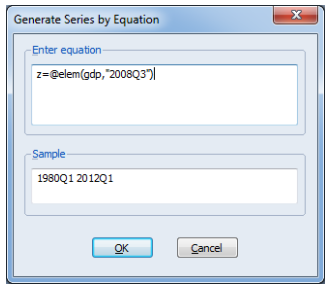
- As another example, suppose you would like to create a new series where each value is the same as the Q3 2008 value of series "*gdp*".

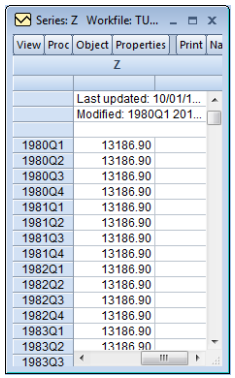
  Creating a series by transforming an existing series: Example 3

  1. Click **Quick → Generate Series** from the menu toolbar.
  2. The window "***Generate Series by Equation***" opens. Type your data transformation as follows:

     z = @elem(gdp,"2008Q3")
  3. The new series ***z*** is equal to the GDP value in Q3 2008.
- Note that series z is equal to the gdp value of Q3 2008.







Creating Series Using Samples: Example 1

- You can use samples to create a new series from an existing series.
- Suppose you would like to create a series w1= log(gdp) if gdp increases compared to the previous period.

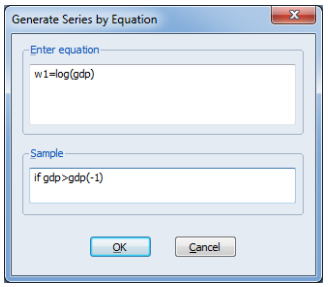
Creating a series by using samples: Example 1

1. Click on the *Timeseries* page, and then click **Quick → Generate Series** from the menu toolbar.
2. The window "***Generate Series by Equation***" opens. On the top portion, under "***Enter Equation***", type the desired transformation:

   w1=log(gdp)
3. In the lower portion of the box under "***Sample***", type the "if" sample condition:

   if gdp>gdp(-1)

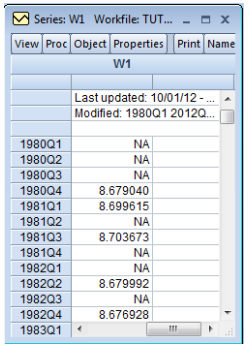
Note: *gdp(-1)* denotes the first lag of *gdp* series. For more details on lag specification, see tutorial on *Data Functions.*



Note: These commands instructs EViews to generate a series w1 = log(gdp) when gdp increased compared to the previous period.

Creating Series Using Samples: Example 1 (cont'd)

- The new series is shown here.
- Note that the new series (*w1*) has the structure of the GDP series.
- Note also that **NA**s are propagated for those values that do not satisfy the "if" condition (i.e., gdp is either equal or declined compared to the previous period).



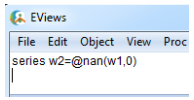
Creating Series Using Samples: Example 1 (cont'd)

- You can replace the missing values (**NA**s) with zeros (see below for more details on handling missing values).

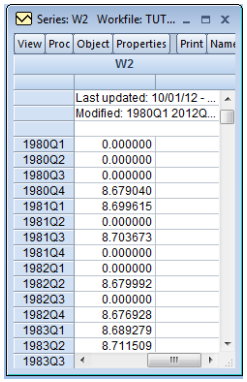
To replace **NA** values with zeros:

1. Create a new series by typing in the command window:

   series w2=@nan(w1,0)
2. Press **Enter**.



- Note that ***@nan(w1,0)*** instructs EViews to create a new series *w2* equal to *w1* if w1≠NA, and 0 otherwise.
- Note that series *w2* (shown here) no longer has **NA** values. They are all replaced by zeros.

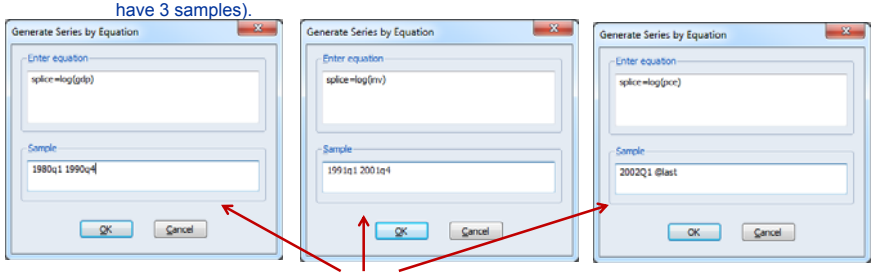


Creating Series Using Samples: Example 2

- By modifying the sample, you can also create a new series by splicing a number of existing series.

Creating a series by using samples: Example 2

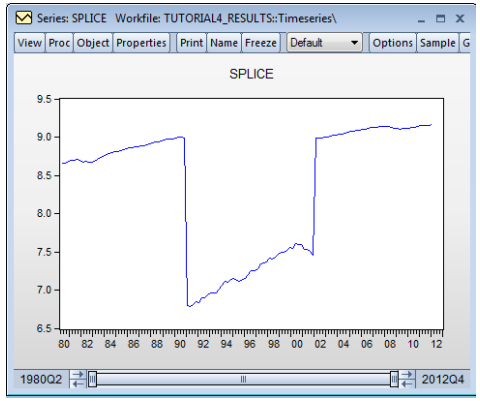
1. Click on the *Timeseries* page, and then click **Quick → Generate Series** from the toolbar.
2. The window "***Generate Series by Equation***" opens.
3. Type the expressions shown below (you need to repeat steps 1-2 three times since we have 3 samples).



The series *splice* is defined as follows:
splice = log(gdp) from Q1 1980 to Q4 1990
splice = log(inv) from Q1 1991 to Q4 2001
splice = log(pce) from Q1 2002 until the end of the workfile range

Creating Series Using Samples: Example 2 (cont'd)

- A graph of the new series "splice" is shown here.
- As you can see, the series is constructed according to our specifications in all three ***Generate Series by Equation*** dialog boxes where we specified the samples.

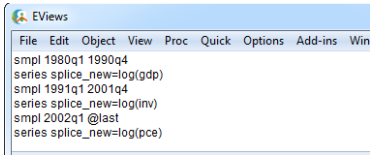


Creating Series Using Samples: Example 2 (cont'd)

- You can also create the above series by specifying the samples in the command window.

Creating a series using samples via the command window:

1. Type in the command window:
   smpl 1980q1 1990q4
   series splice_new=log(gdp)
   smpl 1991q1 2001q4
   series splice_new=log(inv)
   smpl 2002q1 @last
   series splice_new=log(pce)
2. Note: you need to press **Enter** after every command line above. The easiest way to accomplish this is to copy/paste each line in the command window and hitting **Enter** after every entry.



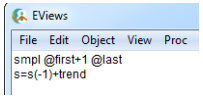
Note: Since the sample has changed using these commands, you may want to revert to the full range by typing ***smpl @all*** in the command window.

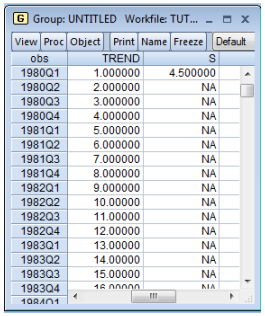
Creating Series Using Samples: Example 3

- As a last example, consider the following scenario: suppose you have a ***trend*** series and only the initial value for series ***s*** (as shown below).
- You would like to create a new series by summing up ***s(-1)*** with the ***trend*** series.

Creating a series by using sample commands: Example 3

1. In the command window, type the following:
   smpl @first+1 @last
   s=s(-1)+trend
2. Press the **Enter** key.

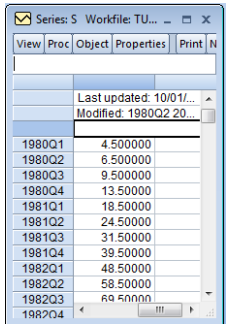




Note: Using ***@first+1*** starts the sample from the 2nd observation onwards. This is because wehave the initial value for the series, but want to compute the rest.

Creating Series Using Samples: Example 3 (cont'd)

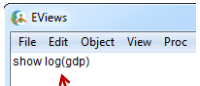
- The spreadsheet for the complete series *s* is shown here.
- As seen, the series starts at 4.5 (in Q1980) and grows over time at the same rate as the *trend* series.



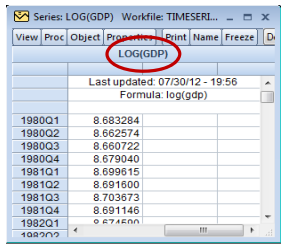
Auto Series

Auto-Series

- EViews allows you to work with expressions directly, without having to create and save a new series.
- Expressions that are used in place of a series, are called ***auto-series***.
- To create auto-series simply enter expressions anywhere you might use a series name.
- The great advantage of auto-series is that when the underlying data changes, the auto-series will automatically reflect these changes.
- The auto-series is deleted from the memory when you close the auto-series window. If you wish to save the series, simply click on the Name button and enter a name.



Command "***show log(gdp)***" creates an auto-series "log(gdp)"



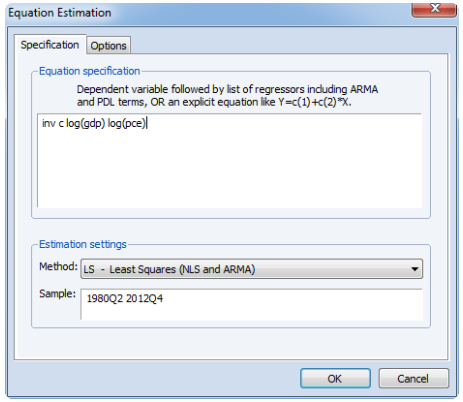
This shows that in place of the series name, EViews substitutes the expression used to create the series.

Auto-Series in Regressions (cont'd)

- You can use expressions (***auto-series***) when estimating a regression (for more details see tutorial on *Estimation*).
- Auto-series can be dependent and/or independent variables.

Specifying an equation with Auto Series

1. Click on Timeseries page. Click on **Quick → Estimate Equation.**
2. The **Equation Estimation** dialog box (shown here) opens up. Type here your series and auto-series, using spaces as shown. Note that **c** stands for constant.
3. Click **OK**.



Auto-Series in Regressions (cont'd)

- The estimation output is shown here.
- Note that if an auto-series is the dependent variable, EViews will forecast the untransformed (original) variable and adjust the estimated confidence interval.

Equation: UNTITLED Workfile: TUTORIAL4_RESULTS::Timeseries\

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

Dependent Variable: INV
Method: Least Squares
Date: 02/28/13 Time: 21:09
Sample (adjusted): 1980Q2 2012Q1
Included observations: 128 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18552.38	1496.461	-12.39750	0.0000
LOG(GDP)	5616.441	1258.269	4.463625	0.0000
LOG(PCE)	-3587.128	1152.239	-3.113181	0.0023

R-squared	0.885094	Mean dependent var	1400.323
Adjusted R-squared	0.883255	S.D. dependent var	494.6934
S.E. of regression	169.0265	Akaike info criterion	13.12115
Sum squared resid	3571246.	Schwarz criterion	13.18799
Log likelihood	-836.7534	Hannan-Quinn criter.	13.14831
F-statistic	481.4216	Durbin-Watson stat	0.044131
Prob(F-statistic)	0.000000		

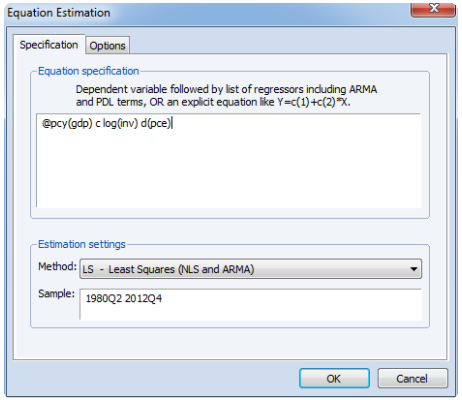
Auto-series as Independent variables

Auto-Series in Regressions (cont'd)

- This next example shows the use of auto-series both as dependent and independent variables.

Specifying an equation with Auto Series

1. Click on Timeseries page. Click on **Quick → Estimate Equation.**
2. The **Equation Estimation** dialog box (shown here) opens up. Type here your series and auto-series, using spaces as shown.
3. Click **OK**.



Auto-Series in Regressions (cont'd)

- The estimation output is shown here.
- Note that both dependent and independent variables are auto-series.
- The auto-series are defined as follows:
  - @pcy(gdp) denotes the year-over-year change in *gdp*.
  - log(inv) denotes the log of *inv* series.
  - d(pce) denotes the difference (from one period to another) in *pce*.

Equation: EQ02 Workfile: TUTORIAL4_RESULTS::Timeseries\

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

Dependent Variable: @PCY(GDP)
Method: Least Squares
Date: 02/28/13 Time: 21:11
Sample (adjusted): 1981Q1 2012Q1
Included observations: 125 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.934987	3.440827	1.724872	0.0871
LOG(INV)	-0.644621	0.482488	-1.336036	0.1840
D(PCE)	0.030850	0.004605	6.698986	0.0000

R-squared	0.268933	Mean dependent var	2.716853
Adjusted R-squared	0.256948	S.D. dependent var	2.216238
S.E. of regression	1.910407	Akaike info criterion	4.156217
Sum squared resid	445.2581	Schwarz criterion	4.224097
Log likelihood	-256.7636	Hannan-Quinn criter.	4.183793
F-statistic	22.43966	Durbin-Watson stat	0.645374
Prob(F-statistic)	0.000000		

Auto-series as Dependent and Independent variables

Missing Values

A Few Notes on Missing Values

- EViews uses the code **NA** to represent missing data values.
- EViews always excludes observations with **NA**s from statistical calculations (data analysis, regressions, etc.).

Identifying NA Values to EViews

- EViews will identify correctly any missing data codes from binary files created by other statistical programs.
- When reading data from a foreign source (such as Excel®), EViews will automatically convert all non-numeric text into **NA** when it expects a numerical value.
- If missing data is identified by "-999" or "0" (or some other value) in the external file, you can instruct EViews to translate these into **NA** values.

Missing Values: Example 1

As a first example, suppose that the missing data in an external file (Excel® in this case) is coded in a *text format* as "*none*" as shown below.

Missing Values: Example 1

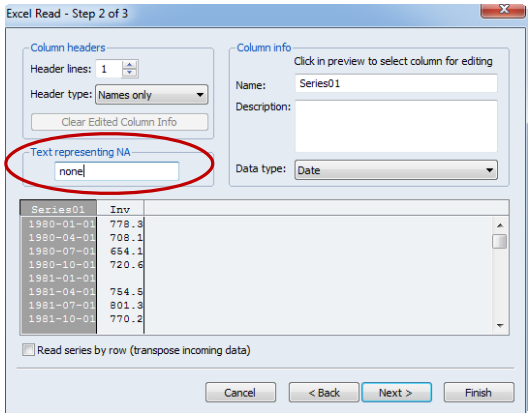
1. Click on the *Missing_Example1* EViews page on the ***Tutorial4.wf1*** file.
2. Load the data in EViews by clicking on **File → Open → Foreign Data as Workfile in** the EViews toolbar (make sure the *Missing_Example1* tab is also clicked in the Excel file ***Tutorial4_Data.xls*****).**

Note: In general, if the foreign data source (e.g., excel file) has many tabs, you need to click on the specific tab from which you wish to load the data in EViews. Then you may proceed to load the data. This ensures that the data loaded in EViews come from this Excel tab, not others.

	A	B
1		Inv
2	Jan-80	778.3
3	Apr-80	708.1
4	Jul-80	654.1
5	Oct-80	720.6
6	Jan-81	none
7	Apr-81	754.5
8	Jul-81	801.3
9	Oct-81	770.2
10	Jan-82	none
11	Apr-82	689.4
12	Jul-82	681.3
13	Oct-82	620.7
14	Jan-83	none
15	Apr-83	704.8

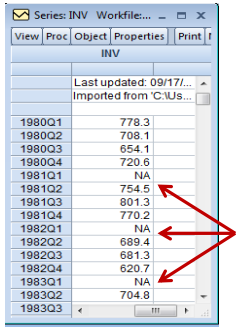
A Few Notes on Missing Values: Example 1 (cont'd)

3. The **Excel Read** dialog box opens up; click on **Next.**
4. Under "***Text Representing NA***" specify the missing code; in this case "*none*".
5. Press **Finish**.



Missing Values: Example 1 (cont'd)

- Open the "*inv*" series and notice that EViews has converted the missing Excel values with code "none", to **NA**s.
- Note: EViews allows only one code to be translated this way. For multiple codes, see Example 3 below.



Converted to NA values

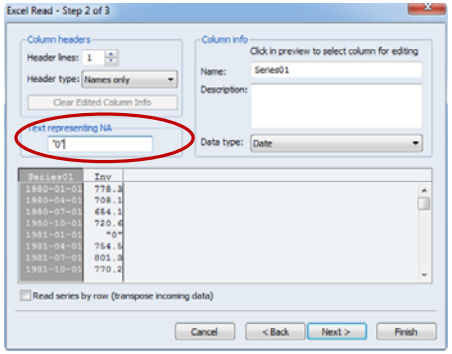
Missing Values: Example 2

- Suppose that the missing data in an external file is coded as "*0*".

Missing Values: Example 2

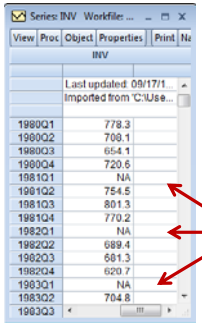
1. Click on the *Missing_Example2* EViews page on the ***Tutorial4.wf1 file***.
2. Load the data in EViews by clicking on **File → Open → Foreign Data as Workfile** in the EViews toolbar (make sure the *Missing_Example2* tab is also clicked in the excel file ***Tutorial4_Data.xls***).
3. The **Excel Read** dialog box opens up; click on **Next.** Under "***Text Representing NA***" specify the missing code; in this case "*0*".
4. Press **Finish**.

	A	B
1		Inv
2	Jan-80	778.3
3	Apr-80	708.1
4	Jul-80	654.1
5	Oct-80	720.6
6	Jan-81	"0"
7	Apr-81	754.5
8	Jul-81	801.3
9	Oct-81	770.2
10	Jan-82	"0"
11	Apr-82	689.4
12	Jul-82	681.3
13	Oct-82	620.7
14	Jan-83	"0"
15	Apr-83	704.8



Missing Values: Example 2 (cont'd)

- Open the "*inv*" series and notice that EViews has converted the missing Excel values with code "0", to **NA**s.
- Note: EViews allows only one code to be translated this way. For multiple codes, see Example 3 below.



Converted to NA values

Missing Values: Example 3

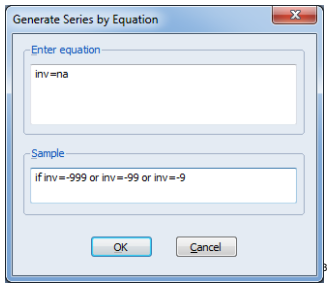
- As a final example, suppose that the missing data in an external file is coded as "-9", "-99" and "-999".

Missing Values: Example 3

1. Click on the *Missing_Example3* EViews page on the ***Tutorial4.wf1 file***.
2. Load the data in EViews by clicking on **File → Open → Foreign Data as Workfile** in the EViews toolbar (make sure the *Missing_Example3* tab is also clicked in the excel file ***Tutorial4_Data.xls***).
3. The ***Excel Read*** box opens; click **Finish** to load the data, ignoring missing values for now.
4. Click on **Quick → Generate Series by Equation.**
5. The **Generate Series by Equation** box opens up. Recode the values as shown below.
6. Click OK.

		Inv
2	Jan-80	778.3
3	Apr-80	708.1
4	Jul-80	654.1
5	Oct-80	720.6
6	Jan-81	-999
7	Apr-81	754.5
8	Jul-81	801.3
9	Oct-81	770.2
10	Jan-82	-99
11	Apr-82	689.4
12	Jul-82	681.3
13	Oct-82	620.7
14	Jan-83	-9

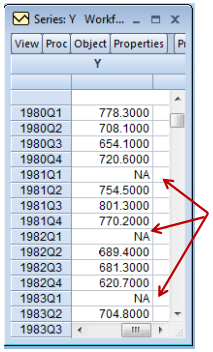
Note: The command specified in the box tells EViews to set to "NA" all "inv" values if these values are -999, or -99, or -9.



Missing Values: Example 3 (cont'd)

- Open the "*inv*" series and notice that EViews has converted the missing Excel values with code "-999", "-99" or "-9" to **NA**s.
- Note: an alternative way to recode the data would be to type the following in the command window:

  series y =*@recode(inv = -9 or inv = -99 or inv = -999, NA,inv)*
- This creates a new series *y* where all the missing values are coded as NA.



Converted to NA values

A Few Notes on Missing Values: Handling NAs

- Ordinarily, any operations involving an **NA** value will result in **NA**.
- For example, comparisons involving **NA** values, propagate **NA** values.
- EViews includes a set of special functions that help out in handling **NA**s.

Main Functions for Missing Values

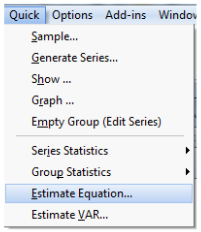
Function	Description
@isna(x)	takes the value of 1 if X = NA, 0 otherwise.
@nan(x,y)	takes the value of X if X≠NA and Y if X=NA.
@nan(x,0)	takes the value of X if X≠NA and 0 if X=NA.
series z = (x=y)	series is equal to 1 if x = y and 0 otherwise. **NA**s are propagated (if any of the series has missing values).
series z=@eqna(x,y)	series is equal to 1 if x = y and 0 otherwise. **NA**s are not propagated (missing values are replaced with 0).
series z=neqna(x,y)	series is equal to 1 if x and y are not equal and 0 if they are equal. **NA**s are not propagated (missing values are replaced with 0).

Missing Values and Regression Analysis

- EViews always excludes missing values from regressions (and other statistical analysis.
- Suppose that you would like to run a regression of "*inv*" on "*gdp*", but "*inv*" has missing values.
  - ✓ In the *Missing_Regression* tab of the ***Tutorial4_Data.xlsx***, there are a total of 129 observations for "gdp" but only 125 for "inv", since the latter is missing 4 values as shown below.

Missing Values and Regressions

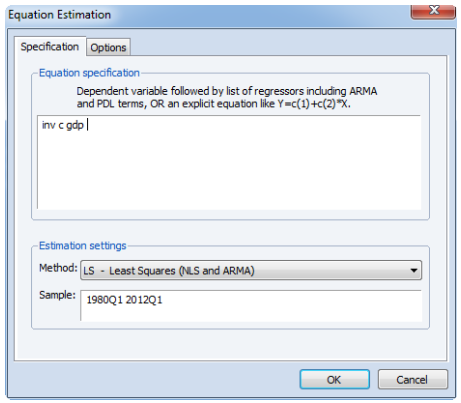
1. Click on the *Missing_regression* EViews page on the ***Tutorial4.wf1 file***.
2. Load the data in EViews by clicking on **File → Open → Foreign Data as Workfile** in the EViews toolbar (make sure the *Missing_regression* tab is also clicked in the excel file ***Tutorial4_Data.xls***). The ***Excel Read*** box opens; click **Finish** to load the data.
3. Select **Quick → Estimate Equation** from the main menu.



	A	B	C
1		GDP	Inv
2	Jan-80	5903.4	778.3
3	Apr-80	5782.4	708.1
4	Jul-80	5771.7	NA
5	Oct-80	5878.4	720.6
6	Jan-81	6000.6	792.2
7	Apr-81	5952.7	NA
8	Jul-81	6025	NA
9	Oct-81	5950	770.2
10	Jan-82	5852.3	NA
11	Apr-82	5884	689.4
12	Jul-82	5861.4	681.3
13	Oct-82	5866	620.7
14	Jan-83	5938.9	642.8

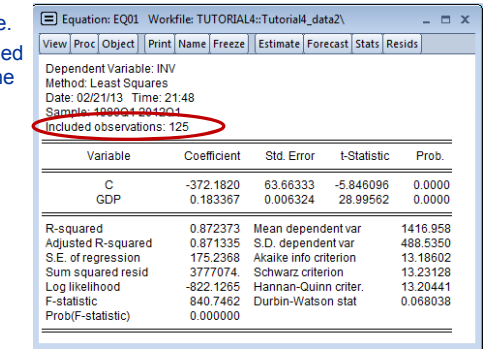
Missing Values and Regression Analysis (cont'd)

4. Define the regression in the Equation Estimation box that opens up. Here we are regressing *inv* on a constant (*c*) and *gdp*.
5. Click **OK**.



Missing Values and Regression Analysis (cont'd)

- The estimation output is shown here.
- As you can see, EViews has excluded the missing values and estimated the regression over 125 observations.



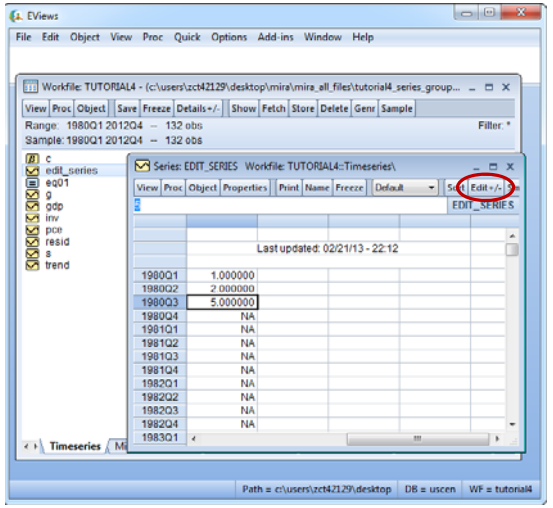
Editing, Documenting, Displaying Series

Editing a Series: Example 1

- It is very easy to edit a series in EViews.

Editing a series: Example 1

1. Click on ***Timeseries*** page in *Tutorial4.wfi.*
2. Double-click to open the edit_series data.
3. Click the Edit+/- button on the series toolbar to turn on editing mode. This allows you to type in data, change data, etc..



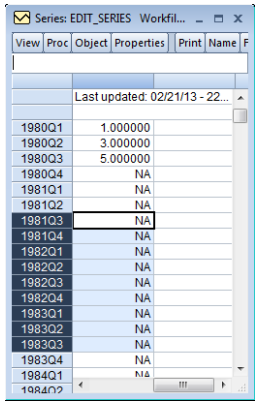
Editing a Series: Example 2

- You an also change a number of cells and set them equal to a certain value.
- For example, suppose you would like to set all the cells highlighted in the series below (*edit_series*) equal to 4.

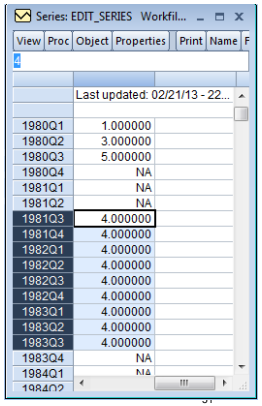
Editing a series: Example 2

1. Click on ***Timeseries*** page in *Tutorial4.wfi.*
2. Double-click to open the edit_series data.
3. Highlight the cells you would like to edit (as shown here).
4. Type "***=4***" in the edit window at the top of the series.
5. Press **Enter**.
- As you can see, the series cells are replaced with the value we specified.

Original Series



Edited Series



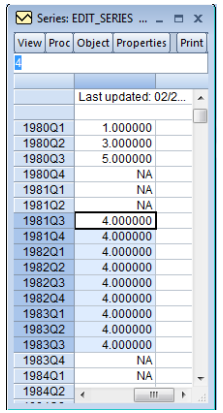
Editing a Series: Example 3

- Suppose you now would like add "+1" to all the your existing observations.

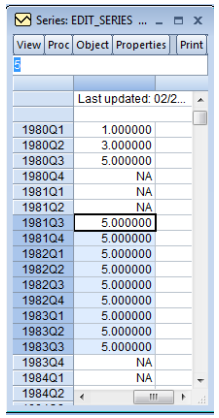
Editing a series: Example 3

1. Follow steps 1-2 shown in Example 2.
2. Highlight the cells you would like to edit (as shown here).
3. Type "***+=1***" in the edit window at the top of the series.
4. Press **Enter**.
- As you can see, each value in the new region is equal to the original value plus 1, as we specified.

Original Series



Edited Series



Editing a Series: Example 4

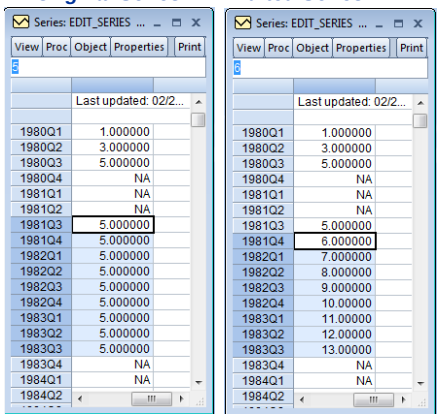
- Suppose you now would like add "+1" to all the previous observation, recursively.

Editing a series: Example 4

1. Follow steps 1-2 in Example 2.
2. Highlight the cells you would like to edit (as shown here). Make sure you highlight the data starting in 1981Q4 (not 1981 Q3) since the previous cell (1981Q2) does not have data.
3. Type "**+_*1***" in the edit window at the top of the series.
4. Press **Enter**.

- As you can see, each value in the new region is equal to the previous value plus 1. This is done recursively; only the first cell uses original data.

Original Series ***Edited Series***



Editing a Series in EViews: A Few Notes

- Note that Examples 2, 3 and 4 above were not done recursively.
- For example, we performed Example 2 on the original data, and Example 3 on the data that were changed by Example 2.
- EViews does not remember the "original" state of the data in the spreadsheet - once you used an array expression to change the data, that change is permanent and all subsequent modifications are made using the new data.

Editing a Series in EViews: A Few Notes (cont'd)

- Operators (i.e., "=+1", "+_1") define how the new values are computed.
- Below, we list the available operators to editing a series

Operators to Edit/Change Series Values

Operator	Description
=	Overwrites the existing value with a new value.
+=	Adds the new value to the existing value.
-=	Subtracts the new value from the existing value.
*=	Multiplies the existing value by the new value.
/=	Divides the existing value by the new value.
=_	Overwrites the existing value with the previous cell's value.
+_	Adds the new value to the previous cell's value.
-_	Subtracts the new value from the previous cell's value.
*_	Multiplies the previous cell's value by the new value.
/_	Divides the previous cell's value by the new value.
\	Reverses the order of the selected cells.

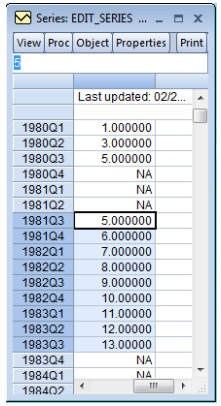
Editing a Series: Example 5

- If you wish, you also could specify only the start and the end points of the observations you wish to edit and allow EViews to fill in the rest.

Editing a series: Example 5

1. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi.*
2. Highlight the cells you would like to edit (as shown here).
3. Type "***=10..20***" in the edit window at the top of the series. This instructs EViews that the starting value of the series is 10 and the end is 20.
4. Press **Enter**.

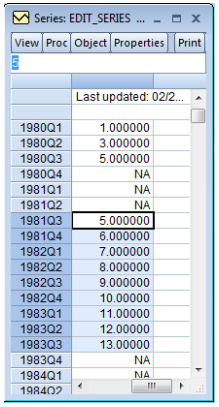
Original Series



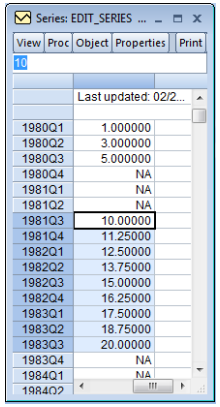
Editing a Series: Example 5 (cont'd)

- The edited series (together with the original series) are shown here.
- As you can see, the range for the values of the edited series start with 10 and end with 20. The cells in between were interpolated using simple linear interpolation.

Original Series



Edited Series



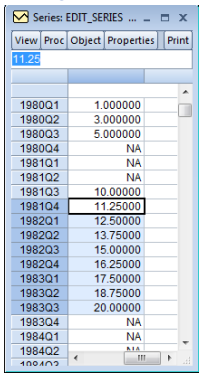
Editing a Series: Example 6

- You can also use any of the operators (shown in the earlier table) to set the start and end range of the interpolation.
- Suppose for example, that you would like to add the interpolated values between 10 and 20 to the previous cell's values.

Editing a series: Example 6

1. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi.*
2. Highlight the cells you would like to edit (as shown here). Make sure you highlight the data starting in 1981Q4 (not 1981 Q3) since the previous cell (1981Q2) does not have data.
3. Type "***+_5..14***" in the edit window at the top of the series. This instructs EViews to add the numbers between the range of 5 and 14 (interpolated) to the previous cell's values.
4. Press **Enter**.

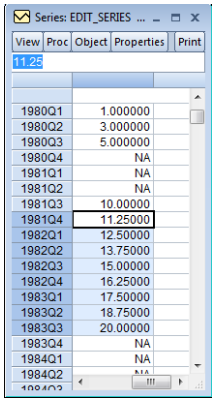
Original Series



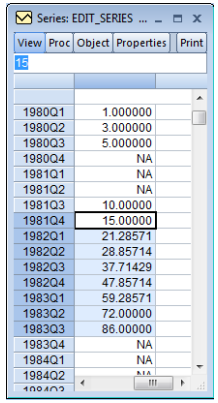
Editing a Series: Example 6 (cont'd)

- The edited series (together with the original series) are shown here.
- As seen, the first value (associated with 1981 Q3) is the same as before (10) since this is where our range starts.
- The next value (1981Q4) is equal to the previous value (10) plus 5 (the start of our interpolation range; recall the interpolation range is 5-14.
- The next value (1982Q1) is equal to the previous value (15) plus the interpolated value of 6.28571.

Original Series



Edited Series



Editing a Series: Example 7

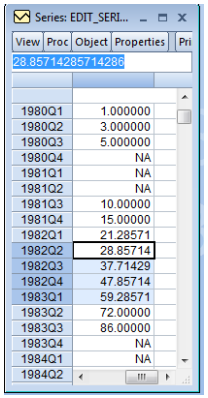
- You do not need to specify start and end values for the range of interpolation.
- If you simply type "..", EViews will consider the value of the previous/next cell (outside the highlighted range) as a start/end points.

Editing a series: Example 7

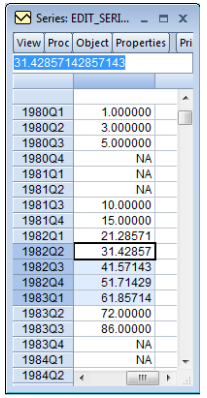
1. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi.*
2. Highlight the cells you would like to edit (as shown here from 1982Q2-1983Q1).
3. Type "***=..***" in the edit window at the top of the series.
4. Press **Enter**.

- As you can see, the values have changed, replaced with interpolated values between 21.28571 and 72.00.

Original Series



Edited Series

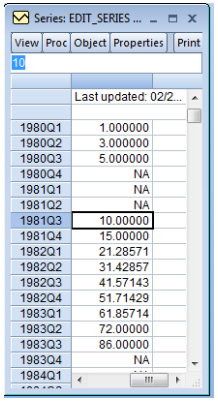


Editing a Series: Example 8

- So far, we have used a linear interpolation.
- We can use other types of interpolation (log linear, cubic spline, etc).

Editing a series: Example 8

1. Let's show an example that compares a linear vs. a log-linear (multiplicative) interpolation. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi*.
2. Highlight the cells you would like to edit (as shown here from 1981Q2-1983Q3).
3. Type "***=5..20***" in the edit window at the top of the series.
4. Press **Enter**.
5. To create the log-linear interpolated values repeat the same steps as above but type instead "***=5..20****" . The added "*******" instructs EViews to use log-linear (multiplicative) interpolation.



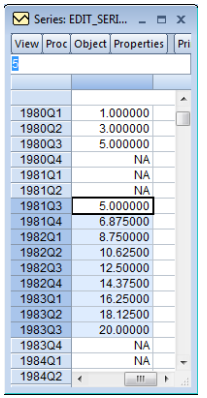
Editing a Series: Example 8 (cont'd)

- Both series are shown here.
- Notice that the start and end values are equal to 5 and 20 (as we specified).
- The interpolated values differ: in the linear case, the interpolated values are equal to **end-start/(N-1),** where N is the number of cells (in our case 9). So, the change from one cell to another is:

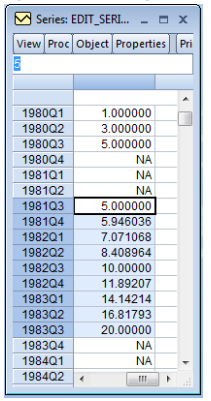
  20-5/9-1=1.875.
- In the log-linear case, the increase in the log value is constant, equal to:

  (log(20)-log(5))/(9-1)=0.25257

Linear Interpolation



Log-Linear Interpolation



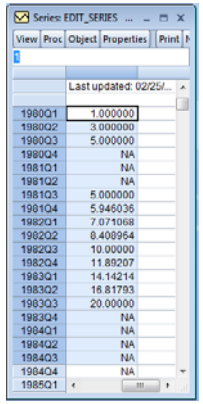
Editing a Series: Example 9

- You can also interpolate missing (**NA**) values.
- There are a number of interpolation techniques in EViews; let's demonstrate a couple.

Editing a series: Example 9

1. Continue to work with the edit_series in the *Timeseries* page. As you can see there are a number of missing values.
2. Highlight the range of series – including the NA values which you would like to interpolate (in this case the range is from 1980Q1-1984-Q3).
3. Type "_" in the edit window at the top of the series.
4. Press **Enter**.

Original Series

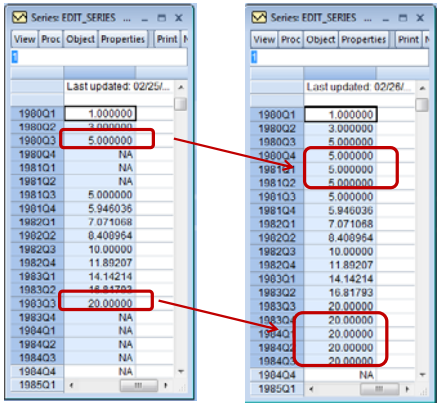


Editing a Series: Example 9 (cont'd)

- The new (edited) series (together with the original series) are shown here.
- Notice that by typing "_" we simply instructed EViews to interpolate all subsequent "**NA**" values with the previous available value.

Original Series

Edited Series



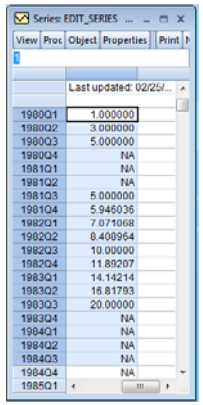
Editing a Series: Example 10

- Suppose that instead of interpolating **NA** values with the previous available value, you would like to use a cubic spline.

Editing a series: Example 10

1. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi.* Since in Example 9 we filled in the missing values with the previous data, first let's try to get the data back to the original state by deleting all the previous entries. For this, click each cell in the range 1980Q4-1981Q2 and 1983Q4-1984Q3 and hit **Delete**.
2. Highlight the range of series –in this case the range is from 1980Q1-1984-Q3).
3. Type "~" in the edit window at the top of the series.
4. Press **Enter**.

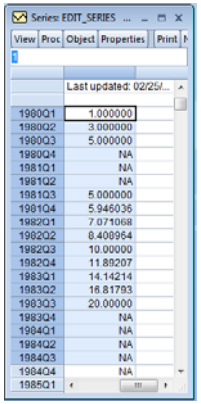
Original Series



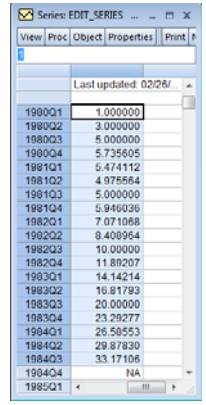
Editing a Series: Example 10 (cont'd)

- The new (edited) series (together with the original series) are shown here.
- Notice that by typing "~" we simply instructed EViews to interpolate all "**NA**" values using a cubic spline method.

Original Series



Edited Series



Editing a Series in EViews: Interpolating NA values

- Each interpolation technique has its own symbol.
- Below, we show the interpolation methods supported by EViews.

Interpolation of missing (NA) values

Operator	Description
_	Repeats previous non-missing values.
^	Linear Interpolation.
~	Cubic spline interpolation.
&	Catmull-Rom spline interpolation.
^*	Log-linear (multiplicative) interpolation (linear in log of data).
~*	Multiplicative cubic spline interpolation (cubic spline on the log data).
&*	Multiplicative Catmull-Rom spline interpolation (Catmull-Rom spline on the log data).

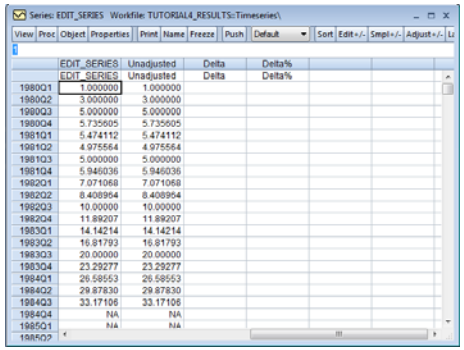
Adjust Mode: Example

- An new feature in EViews 8 is the "**Adjust**" mode which allows you to compare the data in the original series to any changes you may make.

Adjust Mode: Example

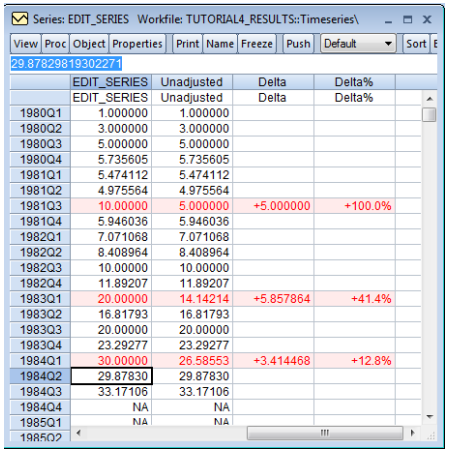
1. Double-click to open the *edit_series* data on ***Timeseries*** page in *Tutorial4.wfi.*
2. Click on the Adjust+/- button in the series toolbar. EViews will add additional columns to the spreadsheet view. The first new column titled "***Unadjusted***" contains a copy of the series values at the moment you entered adjust mode. This "***Unadjusted***" column is fixed and does not change if you change the data.
3. Let's change a few values in the series: replace 1981Q3 with 10; 1983Q1 with 20 and 1984Q1 with 30.

Original Series in Adjust Mode



Adjust Mode: Example (cont'd)

- The result is shown here.
- You can notice that EViews has filled in two new columns "***Delta***" and "***Delta%***".
- "***Delta***" shows the raw difference between the original "***Unadjusted***" series, and the current values in the series.
- "***Delta%***" shows the percentage difference between the original "***Unadjusted***" series and the current values in the series.



	EDIT_SERIES	Unadjusted	Delta	Delta%
	EDIT_SERIES	Unadjusted	Delta	Delta%
1980Q1	1.000000	1.000000		
1980Q2	3.000000	3.000000		
1980Q3	5.000000	5.000000		
1980Q4	5.735605	5.735605		
1981Q1	5.474112	5.474112		
1981Q2	4.975564	4.975564		
1981Q3	10.00000	5.000000	+5.000000	+100.0%
1981Q4	5.946036	5.946036		
1982Q1	7.071068	7.071068		
1982Q2	8.408964	8.408964		
1982Q3	10.00000	10.00000		
1982Q4	11.89207	11.89207		
1983Q1	20.00000	14.14214	+5.857864	+41.4%
1983Q2	16.81793	16.81793		
1983Q3	20.00000	20.00000		
1983Q4	23.29277	23.29277		
1984Q1	30.00000	26.58553	+3.414468	+12.8%
1984Q2	29.87830	29.87830		
1984Q3	33.17106	33.17106		
1984Q4	NA	NA		
1985Q1	NA	NA		
1985Q2				

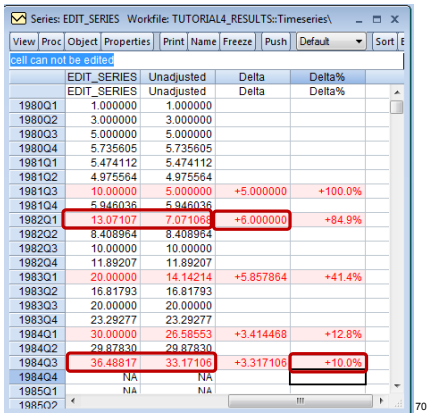
Adjust Mode: Example (cont'd)

- When in ***Adjust*** mode, you can edit any of the cells in the raw series column (the left-most column), or in the "***Delta***" or "***Delta%***" columns.
- Suppose you want the value of the raw data for 1982Q1 for to be 6 units greater than the original value and the data for 1984Q3 to be 10% larger.

Adjust Mode: Example (cont'd)

1. Type "**6**" in the "***Delta***" column in cell 1982Q1.
2. Type "**10**" in the "***Delta%***" column in cell 1984Q3.

- The changes are shown here. Note that the raw data in the "*edit_series*" has changed accordingly.



	EDIT_SERIES	Unadjusted	Delta	Delta%
	EDIT_SERIES	Unadjusted	Delta	Delta%
1980Q1	1.000000	1.000000		
1980Q2	3.000000	3.000000		
1980Q3	5.000000	5.000000		
1980Q4	5.735605	5.735605		
1981Q1	5.474112	5.474112		
1981Q2	4.975564	4.975564		
1981Q3	10.00000	5.000000	+5.000000	+100.0%
1981Q4	5.946036	5.946036		
1982Q1	13.07107	7.071068	+6.000000	+84.9%
1982Q2	8.408964	8.408964		
1982Q3	10.00000	10.00000		
1982Q4	11.89207	11.89207		
1983Q1	20.00000	14.14214	+5.857864	+41.4%
1983Q2	16.81793	16.81793		
1983Q3	20.00000	20.00000		
1983Q4	23.29277	23.29277		
1984Q1	30.00000	26.58553	+3.414468	+12.8%
1984Q2	29.87830	29.87830		
1984Q3	36.48817	33.17106	+3.317106	+10.0%
1984Q4	NA	NA		
1985Q1	NA	NA		
1985Q2				

Adjust Mode: A Few Notes

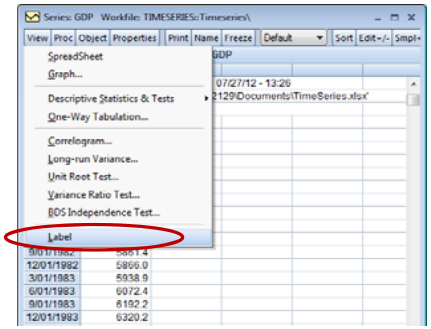
- Unlike simple editing of a series in which changes are permanent, changes in "***Adjust***" mode can be reversed.
- When you exit the "***Adjust***" mode, either by toggling the **Adjust +/-** button, or by closing the series, EViews asks you if you would like to keep the changes you made.
- Note also that any changes made while in ***Adjust*** mode are "live", meaning that any operations (statistical analysis, regressions, etc.) performed using the series will use the current edited values.
- However, exiting the "***Adjust***" mode offers you the chance to revert back to the pre-adjusted values.
- This property of the "***Adjust***" mode can be very useful since it allows you to perform quick "what if" analysis without permanently changing the series.

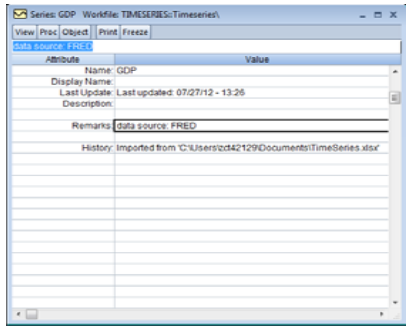
Documenting a Series

EViews allows you to add more information on your data (source, units, remarks) using the ***Label View***.

To add documentation to your data:

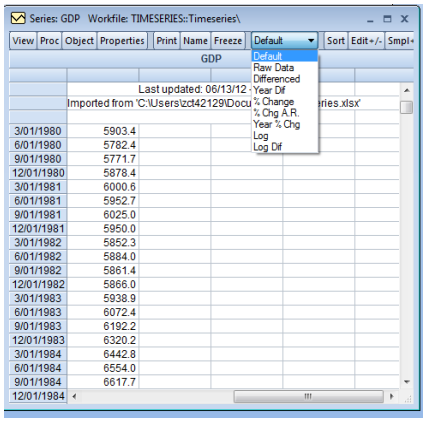
1. On the menu toolbar of a series you wish to document select **View → Label.**
2. The **Series View** changes to allow you to add remarks and other data documentation.





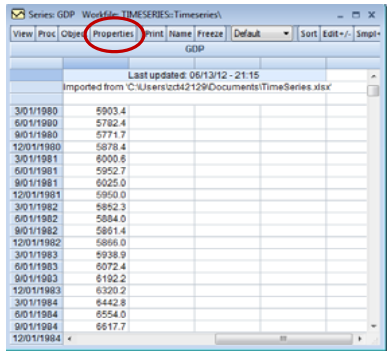
Displaying a Series

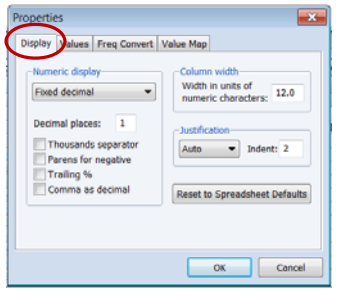
- You can resize the width of a column, change the way the data is displayed, etc., by opening the series spreadsheet display.
- Clicking on the **Default** button displays a drop-down menu, which tells EViews the format of the data.
- The **Default** shows data in raw form; you can change the way the data is displayed by choosing other options from the drop-down menu (differenced, % change, log, etc.).



Displaying a Series (cont'd)

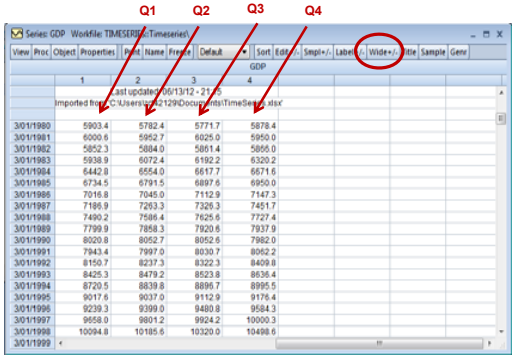
- You can customize the formatting of a series by clicking the **Properties** toolbar of a series spreadsheet.
- This opens up the **Properties** dialog box; select the **Display** tab.
- This menu allows you to change the number of decimals, separate thousands with a comma, or display numbers as fractions.





Displaying a Series: Narrow vs. Wide

- You can customize the formatting of a series by pressing the Wide+/- button from the series spreadsheet toolbar.
- This command arranges the data by the frequency of the series. In this example, the *gdp* series in the ***Timeseries*** page is quarterly.
- A quarterly series will display 4 observations per row, a monthly series 12, and so on.



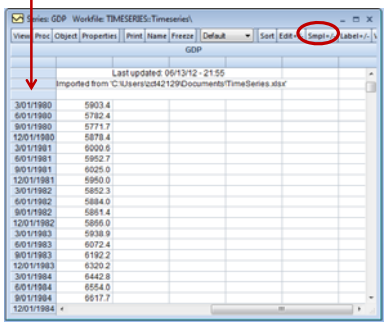
Displaying a Series: Sample Adjustments

- You can toggle between the full range of observations and the current sample by pressing the Smpl+/- button from the series spreadsheet toolbar.
- Suppose you define the sample by typing in command window:

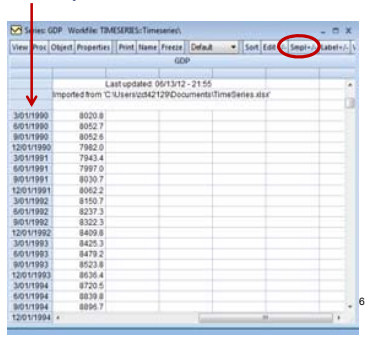
  smpl 1990q1 @last

- You can now toggle between the full range and the newly create sample by pressing the Smpl+/- button.
- The range (full sample) is 1980Q1 - 2012Q1; the sample is from 1990Q1 -2012Q1.

Full Sample



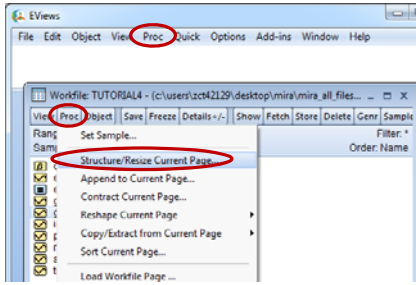
New Sample

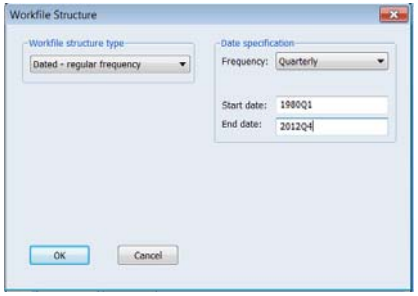


Adding Observations to Existing Workfiles*

If new updates are available for your data you may add them to your existing workfile.

1. Click on ***Timeseries*** page and select **Proc → Structure/Resize Current Page** (either from the main menu toolbar or the workfile toolbar). Alternatively you can double-click **Range** in the upper pane of the workfile window.
2. The ***Workfile Structure*** dialog box opens up which allows you change the range of the workfile. Extend the range of the workfile here (in this case to 2012Q4).
3. Click **OK**.



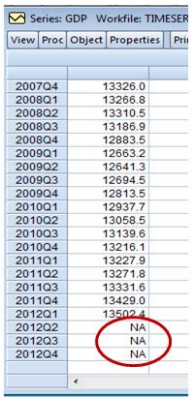


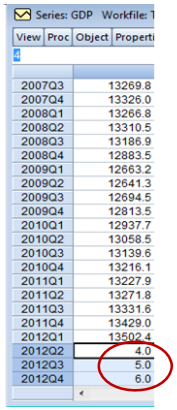
* For a more detailed discussion on this topic see *Advanced Workfiles.*

Adding Observations to Existing Workfiles (cont'd)

3. EViews adds three missing values (**NA**) at the end of each series in the workfile.
4. Copy your data from the source file (Excel or others).
5. In EViews open the series you want to update, click **Edit +/-** button, select the range of **NA** values you wish to update, and right-click **Paste.**

- The NA values that were added originally to the spreadsheet are now updated with the latest values.





Groups

Groups

- Groups help you work with multiple series.
- A Group is a list of series names (and potentially mathematical expressions) that provides access to all the data in that list.
- Once you create a ***Group Object***, you can use the group name in many places to refer to all the series contained in that group.

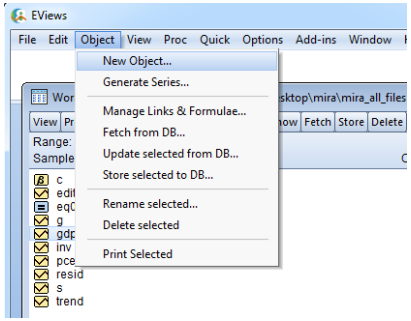
- A few features of groups:
  - ✓A group is a "live" feed and is NOT a copy of each individual series. This means that if the data in one of the series changes, these changes will also be reflected in the group containing the series.
  - ✓If a series is deleted from a workfile, the series identifier will be maintained. In the group spreadsheet the deleted series will contain NA values.
  - ✓Renaming a series changes the reference in every group containing the series.

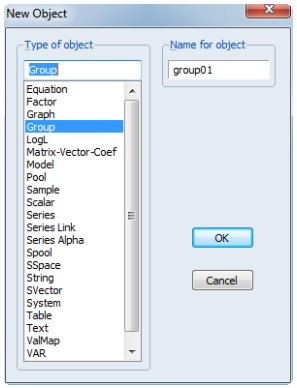
Creating Groups: Example 1

- There are a number of ways to create groups in EViews.

Creating groups: Example 1

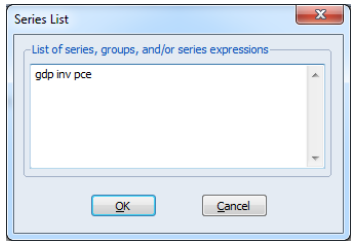
1. Click on ***Timeseries*** page. Select **Object → New Object** from the main menu.
2. The **New Object** box opens up. Select the **Group** option.
3. You can name your group under the section **Name for object** (in this case, we named it *group01*), then press **OK**.





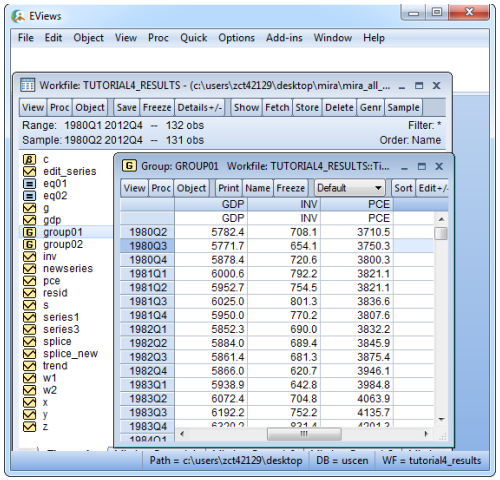
Creating Groups: Example 1 (cont'd)

4. The **Series List** window appears. Enter the series names you wish to include in the group (separated by spaces).



Creating Groups: Example 1 (cont'd)

- As seen, EViews has added a new object (*group01*) which contains the data from the series we specified.

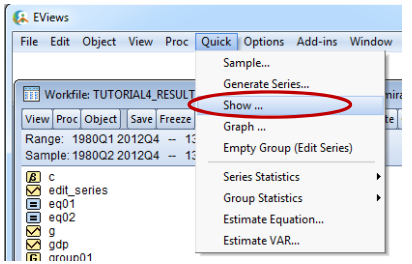


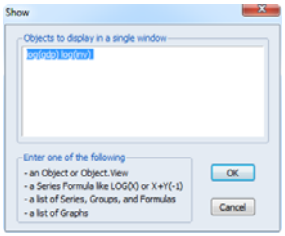
Creating Groups: Example 2

- You can also create a group in EViews is by using the ***Quick*** menu option.

Creating groups: Example 2

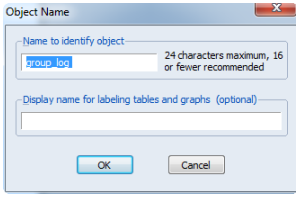
1. Click on ***Timeseries*** page. Select **Quick → Show** from the main menu (or **Show** from the workfile menu).
2. The **Show** window appears. Type here the names of the series you wish to include in the group (in this example, we type **log(gdp) log(inv)**)
3. Press **OK**.

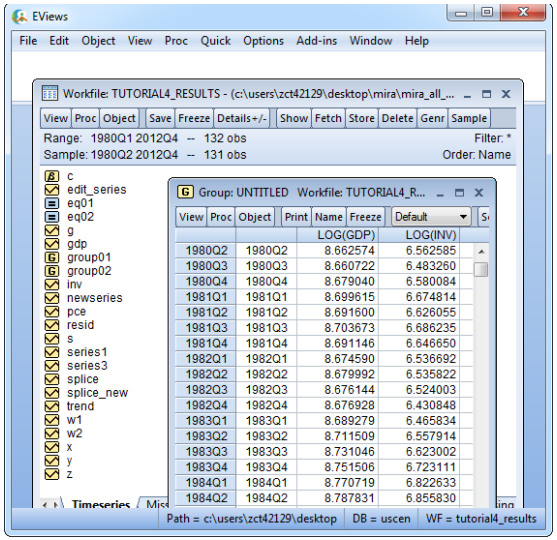




Creating Groups: Example 2 (cont'd)

- The result is shown here. EViews has created a new (untitled) group containing the data from log(gdp) and log(inv).
- If you would like to save the group, click the Name button.
- The ***Object Name*** box opens up (as shown below). Name the group here (in our case *group_log*).



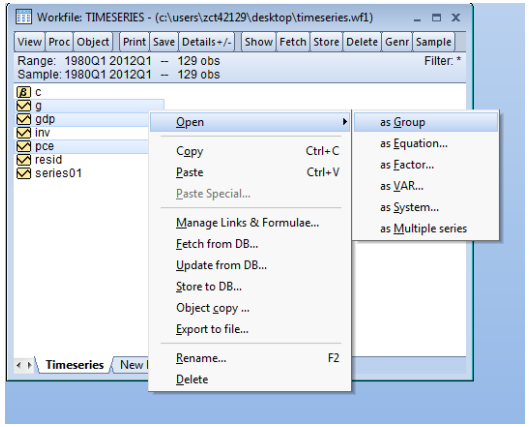


Creating Groups: Example 3

- Perhaps the easiest way to create groups is to select series directly from the workfile.

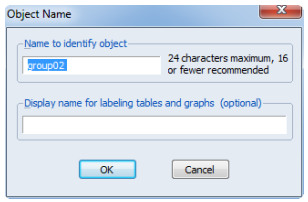
Creating groups: Example 3

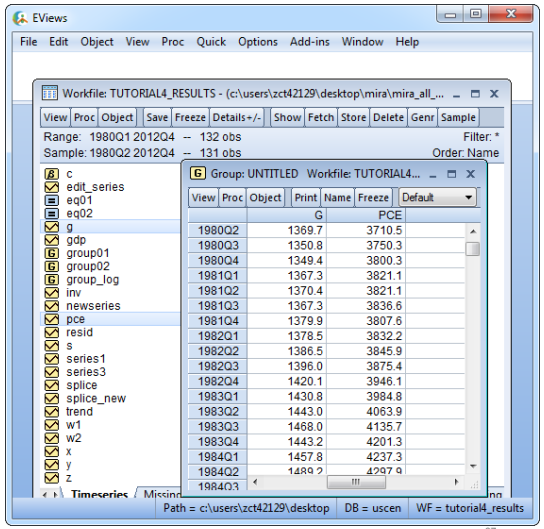
1. Click on ***Timeseries*** page. Highlight the series you wish to group together (in this case *g* and *pce*).
2. Right-click and select: **Open → as Group.**



Creating Groups: Example 3 (cont'd)

- The result is shown here. EViews has created a new (untitled) group containing the data from **g** and **pce**.
- As before, if you would like to save the group, click the Name button.
- The ***Object Name*** box opens up. Name the group here (in our case *group02*).





Creating Groups: Example 4

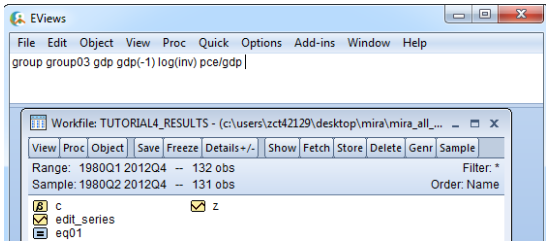
- As a last example, consider creating groups in EViews using the command window.

Creating groups: Example 4

1. Click on ***Timeseries*** page. Type on the command window:

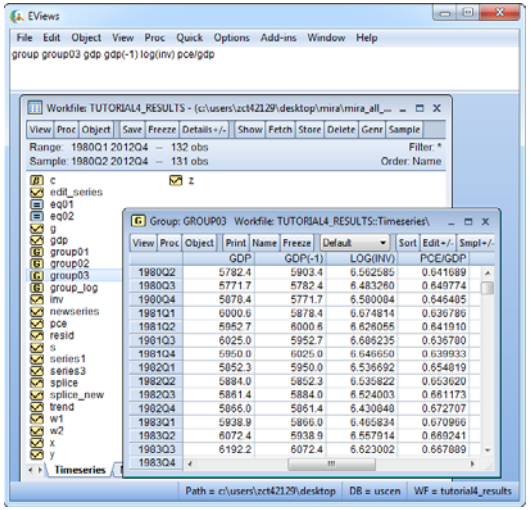
group group03 gdp gdp(-1) log(inv) pce/gdp

2. Press Enter.



Creating Groups: Example 4 (cont'd)

- The result is shown here. As you can notice, EViews has created a new group (*group03*) which contains the series we specified in the command window (*gdp*, *lag GDP*, *log(inv)* and *PCE/GDP*).
- As it must be evindent by now, groups may contain Series and Auto-series (series expressions such as log(inv), gdp(-1) and pce/gdp).

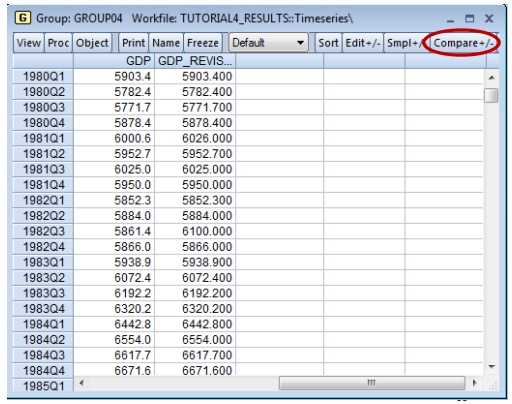


Data Comparison Tools in Groups

- A new feature in EViews 8 allows you to easily compare the data between the series in your group.
- Suppose you have two gdp series: *gdp* and *gdp_revised*, where the second series has more updated data. You would like to compare the two.

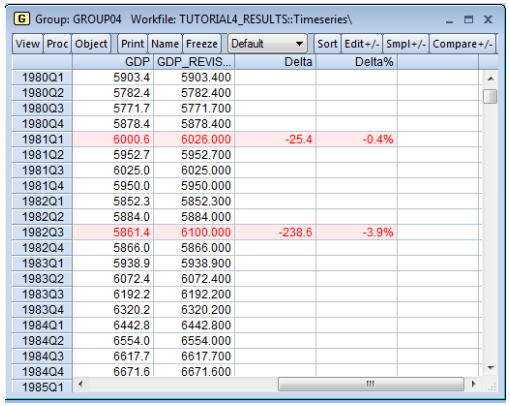
Comparing data between series in a group:

1. Click on ***Timeseries*** page. Click on *gdp* and *gdp_revised* and open these series as a group. Name the group *group04*.
2. Click the Compare+/- button located in the group menu toolbar.



Data Comparison Tools in Groups (cont'd)

- The result is shown here.
- Notice that, similar to the **Adjust+/-** mode explained earlier, the **Compare+/-** command adds two new columns "***Delta***" and "***Delta%***".
- "***Delta***" shows the raw difference between the "*gdp*" and "*gdp_revised*" series.
- "***Delta%***" shows the percentage difference between the two series.

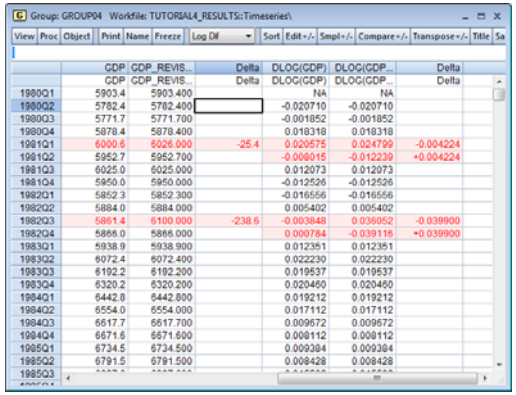


Data Comparison Tools in Groups (cont'd)

- Note that all four columns are fully editable.
- For example, if you would like to remove any differences between the two series, you can accomplish this by typing "*0*" in the "***Delta***" column.
- Note that this change will be reflected in the first series ("*gdp*") and not the second "*gdp_revised*").
- In other words, by typing "*0*" in the "***Delta***" column, you are effectively setting the first series to equal the second series.

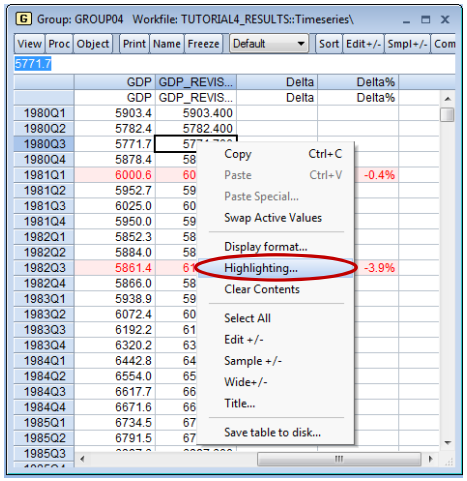
Data Comparison Tools in Groups
(cont'd)

- If you change the series display from **Default** to some other setting, EViews removes the "***Delta%***" column and introduces new columns showing the new transformation and a new "***Delta***" column showing the difference for that transformation.
- Here we chose the ***Log Diff*** view. As you can notice, EViews has added two new columns showing the log difference for each series (*dlog(gdp)* and *dlog(gdp_revised)* and the difference between these two (the new "***Delta***" column).
- Note that, as before, each column is also editable here.



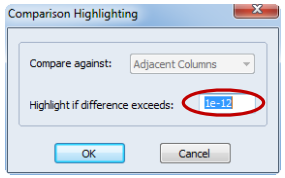
Data Comparison Tools in Groups
(cont'd)

- Note that the default comparison in EViews is done with zero tolerance.
- This means EViews will pick up even the slightest differences between the series and highlight these.
- If you would like to change the default settings for the tolerance level, follow these simple steps:
  1. Right-hand click anywhere on the spreadsheet when in ***Compare*** Mode.
  2. Select **Highlighting.**



Data Comparison Tools in Groups
(cont'd)

3. The ***Comparison Highlighting*** box opens up. Under **Highlight if difference exceeds** field, specify your own tolerance level.
4. Click **OK.**

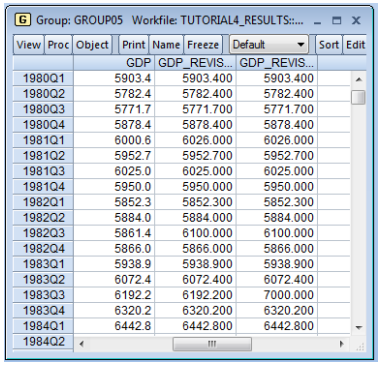


Data Comparison Tools in Groups
(cont'd)

- Finally, note that you can compare more than two series.
- Suppose you have three gdp series: *gdp*, *gdp_revised* and *gdp_revised1*. You would like to see the differences between them.

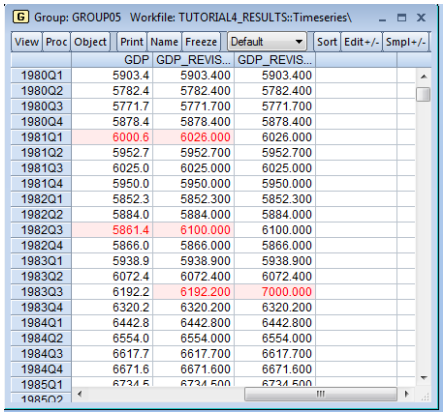
Comparing data between three series in a group:

1. Click on ***Timeseries*** page. Click on *gdp*, *gdp_revised* , and *gdp_revised1* and open these series as a group. Name the group: *group05*.
2. Click the Compare+/- button located in the group menu toolbar.



Data Comparison Tools in Groups
(cont'd)

- The result is shown here.
- Notice that, unlike the previous examples, EViews no longer adds the extra columns.
- It simply highlights the differences between each column.
- Note also that comparisons are carried out in pairs. For example, EViews first compares column 1 with column 2 and highlights those differences. Then it compares column 2 with column 3 and highlights those differences.



	GDP	GDP_REVIS...	GDP_REVIS...
1980Q1	5903.4	5903.400	5903.400
1980Q2	5782.4	5782.400	5782.400
1980Q3	5771.7	5771.700	5771.700
1980Q4	5878.4	5878.400	5878.400
1981Q1	6000.6	6026.000	6026.000
1981Q2	5952.7	5952.700	5952.700
1981Q3	6025.0	6025.000	6025.000
1981Q4	5950.0	5950.000	5950.000
1982Q1	5852.3	5852.300	5852.300
1982Q2	5884.0	5884.000	5884.000
1982Q3	5861.4	6100.000	6100.000
1982Q4	5866.0	5866.000	5866.000
1983Q1	5938.9	5938.900	5938.900
1983Q2	6072.4	6072.400	6072.400
1983Q3	6192.2	6192.200	7000.000
1983Q4	6320.2	6320.200	6320.200
1984Q1	6442.8	6442.800	6442.800
1984Q2	6554.0	6554.000	6554.000
1984Q3	6617.7	6617.700	6617.700
1984Q4	6671.6	6671.600	6671.600
1985Q1	6734.5	6734.500	6734.500
1985Q2			