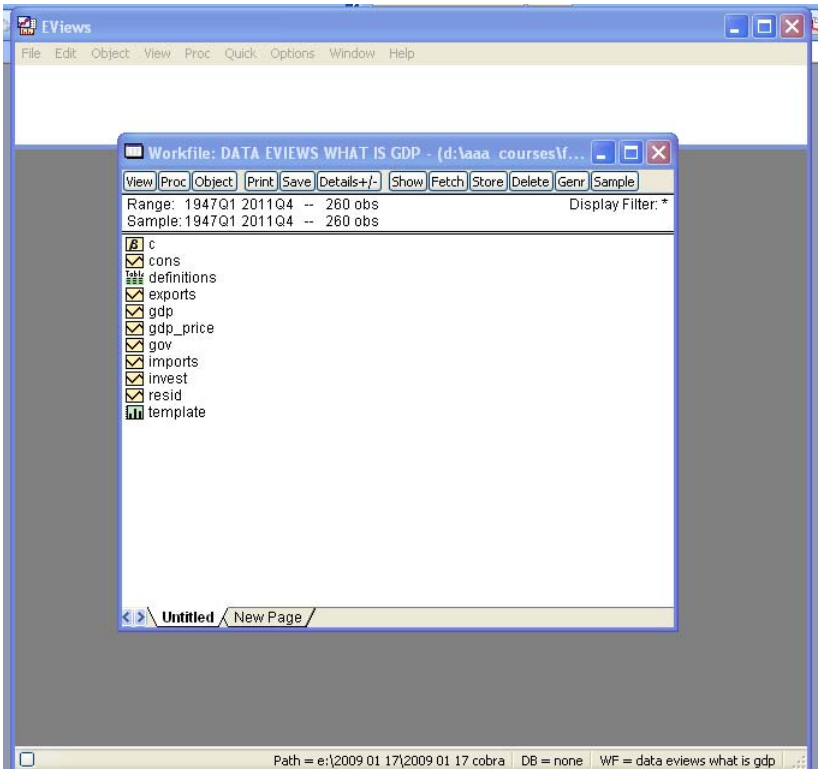


I. GETTING STARTED

This homework is intended to introduce you to E-Views and start you looking at some macro data. Items to be turned in are numbered and indicated in **bold**.

E-Views Actions in Homework #1:

1. **OPEN THE FILE** AND LOOK AT THE DATA
2. MAKE A **LINE GRAPH**
3. **GENERATE** SOME NEW SERIES
4. SELECT A DATA SUBSET USING THE **SAMPLE** COMMAND
5. MAKE A **BAR GRAPH**
6. MAKE A **HISTOGRAM**

OPEN THE FILE AND LOOK AT THE DATA

Open the E-views program. The first line of the display is a menu that looks like:

MENU 1

File	Edit	Objects	View	Procs	**Quick**	Options	Window	Help

⇑

Point and click on the File Menu to obtain the pull-down menu:

Point and click on **Open** and select the file **DATA_Eviews What_is_GDP.wf1**. This will open up an E-views "workfile" that should look like the first page. This file includes data on the following series:

File
New
Open
Save
Save as
Close
Import
Export
Print
Print Setup
Run
Exit

⇐

GDP =	Total value of goods and services produced in the United States, seasonally adjusted at annual rates, billions of dollars
GDP_PRICE =	Price index indicating the overall level of prices in the economy, normalized to set the value in 1987 equal to 100. Thus, for example, the value of GDP_PRICE in the first quarter of 1994 is equal to 125. This means that prices were 25% higher in 1994 compared with 1987.
CONS=	Value of Expenditures on Consumption
INVEST	Value of Expenditures on Invesment
GOV=	Value of Government Purchases of Goods and Services
EXPORTS=	Value of Exports of Goods and Services
IMPORTS=	Value of Imports of Goods and Services

MENU 2 The second line of the display has a menu that looks like:

View	Procs	Save	**Show**	Fetch	Store	Delete	**Genr**	**Sample**

⇑ ⇑ ⇑ ⇑

For now we are going to work with this second menu. When you point to one of these commands and click on the mouse, a submenu will show up. First point to GDP in the workfile. This should highlight GDP. Now point and click on View. You should be seeing a menu that looks like the following:

VIEW
Open Selected
Print Selected
Show
Select All)
Select by Filter
Deselecte All
Display Comments
Display Filter
Name Display
Label
Name Display

⇐

In this menu, choose **Open Selected**. Choice the "One Window" option. Now you should see a spreadsheet that you can maneuver around in the usual way to answer the following questions: (An alternative way of getting here is to double click on GDP)

1) Are the data monthly, quarterly or annual?
2) What is the date of the first observations?
3) What is the date of the last observations?
4) What are the dates of the first and last observations of the "workfile?" In other words, how big is the spreadsheet that you see in front of you?

MAKE A LINE GRAPH

At the top of the spreadsheet window you should see a menu:

View	Procs	Print	Store	Name	Freeze	Edit+/-	Ins/Del	Sampl+/-	Label+/-	Title	Sample	Genr

Click on **View**. You should see a new submenu that looks like:

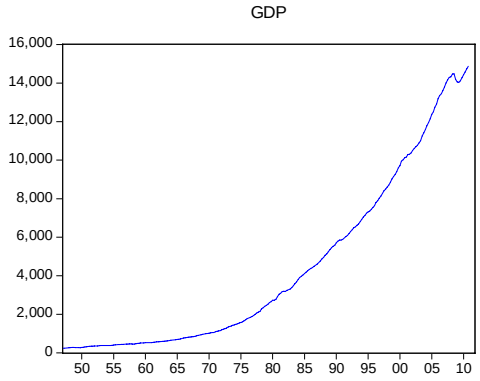
VIEW
Spreadsheet
Line graph
Bar graph
Histogram and Stats
Tabulate
Correlogram
Unit Root Test
Label

⇐

Choose line graph. You should see a graph of the GDP series.

There is even a new menu.

Try double clicking on this graph and see what happens..



GENERATE SOME NEW SERIES

The GDP increases over time partly because the economy produces more goods and services and partly because prices tend to increase over time. The effect of increasing prices can be eliminated by dividing GDP by the price index GDP_PRICE to produce what economists call "**Real GDP**." Let's calculate this series. Go back to the MENU 2. Click on GENR. and type the equation

RGDP = 100*GDP / GDP_PRICE

Point and click on **RGDP** in the list of variables. Hold down the CTRL key and point and click on GDP. This should allow you to highlight both RGDP and GDP at the same time. Double click on one of the highlighted series and select "Open Group" in order to open up both simultaneously. Now click on **View**. Select Graph from the pull-down menu. You should now be seeing a line graph that compares GDP with RGDP.

5) What is the difference, if any, between GDP and RGDP? When are they equal and why? Which grows more rapidly, and why? How big was GDP in the first quarter of 1990? (Get the units right if you can.)

Select data backward in time

Again referring to MENU 2, select SHOW and type GDP GDP(-1) GDP(-2) and hit return?

6) What is the meaning of GDP(-1)?

Generate Annualized Rates of Growth

The data file that has been provided has quarterly data. The GDP figures are *quarterly data at annual rates*, meaning that they have been multiplied by four to transform the measured output in the quarter to the equivalent annual series. Something also has to be done to convert growth over a quarter to the equivalent annual number. This can be done just by multiplying by four, but it is better to allow for compounding using the following formula

$$r_{ANNUAL} = (1 + r_{QUARTER})^4 - 1$$

This formula takes a rate of growth per quarter (defined as a fraction, not a percent) and compounds it four times to obtain the annual growth that would occur if the quarterly rate applied to four consecutive quarters. Confirm that the following formula defines the annualized rate of growth of GDP in percentages:

$$G = 100*(RGDP/RGDP(-1))^4 - 100$$

Another formula for the growth rate is

$$G\_ALT = 400*\log(RGDP/RGDP(-1))$$

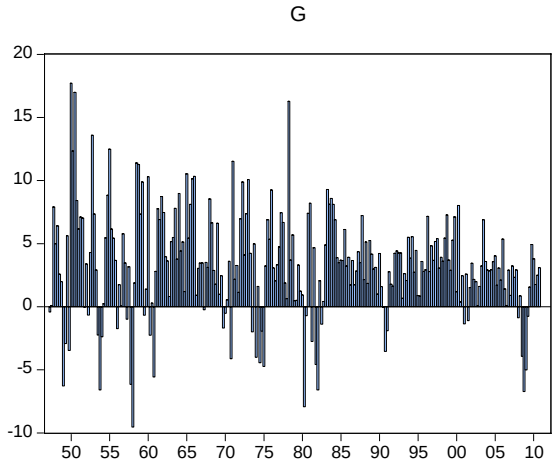
7) **Explain in words what are G and G_ALT.**
8) **What is the meaning of the 100 in each of the formulae for G and RGDP?**
9) **What is the meaning of the 400 in front of the foumula for G_ALT.**

Graphs and DATA SUMMARIES

The first step in any statistical analysis ought to be a graphical examination of the data. This will help to assure that the data have been properly gathered and that important features of the data are not overlooked. During this initial phase, you should be trying out several different transformations of the data and should be identifying the salient features of the time series, such as the existence of a trend and the amount of volatility.

MAKE A BAR GRAPH

Double-click on G. Select the View option and click on **bar graph**. You should be looking at:

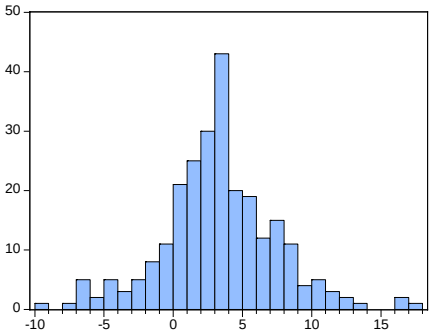


8) **When was the US Economy in recession?** Define a "recession" as a period in which there are two or more consecutive quarters of negative growth in GDP.

9) How bad is the current recession?

Make a histogram

Next click on View again and select "Descriptive Statistics & Tests" and then"Histograms and Stats". Click OK. You should be looking at:

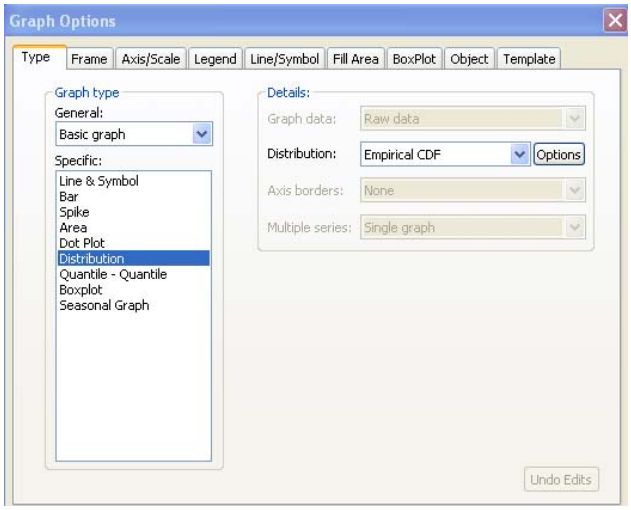


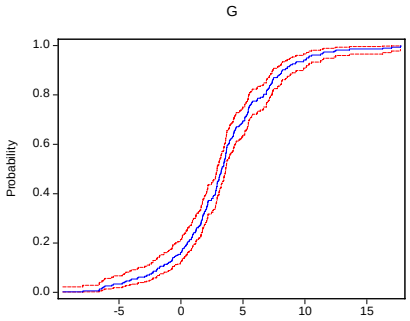
Series: G	
Sample 1947Q1 2011Q4	
Observations 255	
Mean	3.306423
Median	3.238041
Maximum	17.71154
Minimum	-9.537622
Std. Dev.	4.146098
Skewness	0.100370
Kurtosis	4.226731
Jarque-Bera	16.41738
Probability	0.000272

10) What is the total number of observations of the growth rate G?
11) How many times did the growth rate exceed 10?
12) What has been the average growth rate of real GDP?
13) What has been the maximum growth rate of real GDP?
14) When did the maximum occur?
15) Set the SAMPLE to include the data after 1975. What has been the average rate of growth of real GDP since 1975?

Make a Bloxplot and a Cumulative Distribution

Double click on G in your workfile, and then select graph to produce the menu below on the left. Pick Distrib ution and "Empirical CDF" to produce the cumulative distribution displayed below on the right.





16) From this cumulative find approximately the fraction of quarters that have GDP growth in excess of the 2009Q4 value.

17) Make a bloxplot too. What fraction of observations are in the box? (You will need to click on Help to answer this question.