Chapter 2. A Demonstration

In this chapter, we provide a demonstration of some basic features of EViews. The demonstration is meant to be a brief introduction to EViews; not a comprehensive description of the program. A full description of the program begins in Chapter 4, "Object Basics", on page 65.

This demo takes you through the following steps:

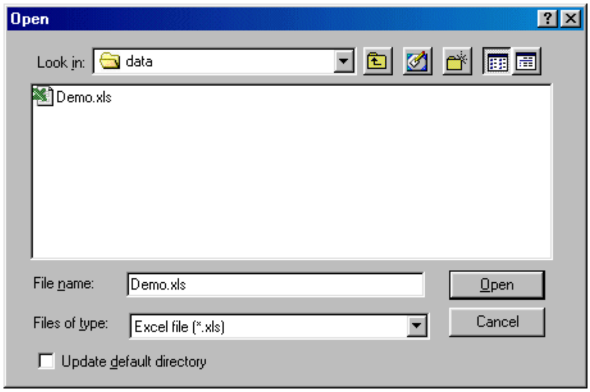
- getting data into EViews from an Excel spreadsheet
- examining your data and performing simple statistical analyses
- using regression analysis to model and forecast a statistical relationship
- performing specification and hypothesis testing
- plotting results

Getting Data into EViews

The first step in most projects will be to read your data into an EViews workfile. EViews provides sophisticated tools for reading from a variety of common data formats, making it extremely easy to get started.

Before we describe the process of reading a foreign data file, note that the data for this demonstration have been included in both Excel spreadsheet and EViews workfile formats in your EViews installation directory ("./Example Files/Data"). If you wish to skip the discussion of opening foreign files, going directly to the analysis part of the demonstration, you may load the EViews workfile by selecting **File/Open/Foreign Data as Workfile...** and opening DEMO.WF1.

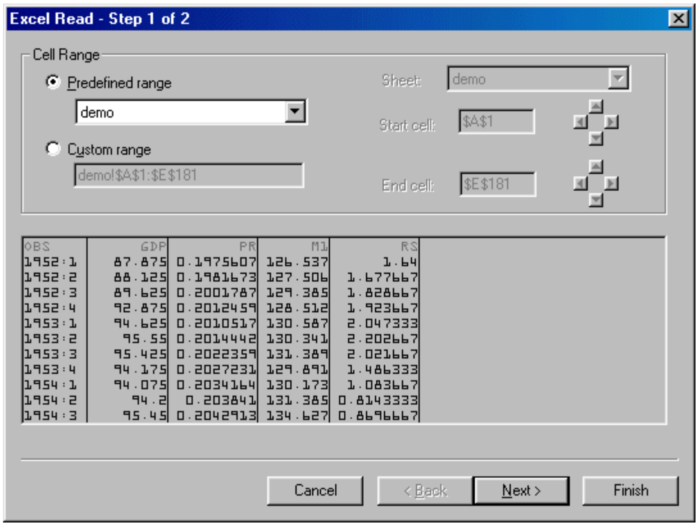
The easiest way to open the Excel file DEMO.XLS, is to drag-and-drop the file into an open EViews application window. You may also drag-and-drop the file onto the EViews icon. Windows will first start the EViews application and will then open the demonstration Excel workfile.



Alternately, you may use the **File/Open/EViews workfile...** dialog, selecting **Files of type** Excel and selecting the desired file.

As EViews opens the file, the program determines that the file is in Excel file format, analyzes the contents of the file, and opens the **Excel Read** wizard.

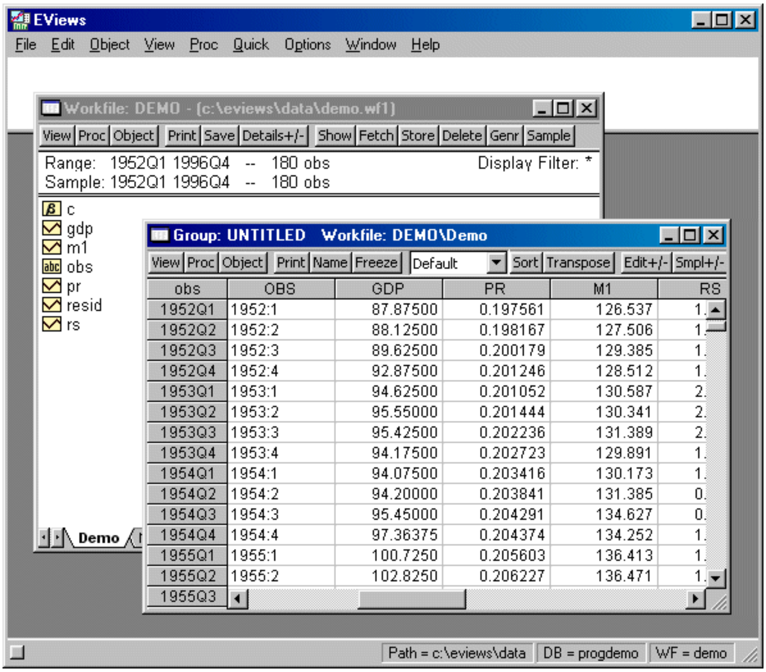
The first page of the wizard includes a preview of the data found in the spreadsheet. In most cases, you need not worry about any of the options on this page. In more complicated cases, you may use the options on this page to provide a custom range of cells to read, or to select a different sheet in the workbook.



The second page of the wizard contains various options for reading the Excel data. These options are set at the most likely choices given the EViews analysis of the contents of your workbook. In most cases, you should simply click on **Finish** to accept the default settings. In other cases where the preview window does not correctly display the desired data, you may click on **Next** and adjust the options that appear on the second page of the wizard. In our example, the data appear to be correct, so we simply click on **Finish** to accept the default settings.

When you accept the settings, EViews automatically creates a workfile that is sized to hold the data, and imports the series into the workfile. The workfile ranges from 1952 quarter 1 to 1996 quarter 4, and contains five series (GDP, M1, OBS, PR, and RS) that you have read from the Excel file. There are also two objects, the coefficient vector C and the series RESID, that are found in all EViews workfiles.

In addition, EViews opens the imported data in a spreadsheet view, allowing you to perform a initial examination of your data. You should compare the spreadsheet views with the Excel worksheet to ensure that the data have been read correctly. You can use the scroll bars and scroll arrows on the right side of the window to view and verify the reminder of the data.



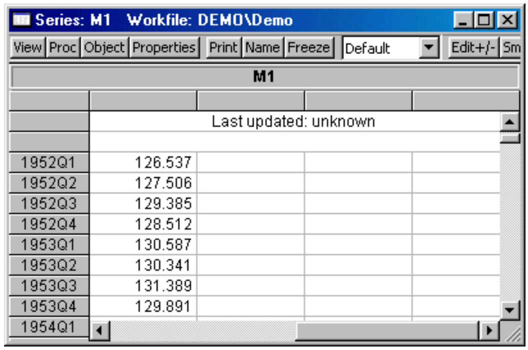
You may wish to click on **Name** in the group toolbar to provide a name for your UNTITLED group. Enter the name ORIGINAL, and click on **OK** to accept the name.

Once you are satisfied that the data are correct, you should save the workfile by clicking on the **Save** button in the workfile window. A saved dialog will open, prompting you for a workfile name and location. You should enter DEMO2.WF1, and then click **OK**. A second dialog may be displayed prompting you to set storage options. Click **OK** to accept the defaults. EViews will save the workfile in the specified directory with the name DEMO2.WF1. A saved workfile may be opened later by selecting **File/Open/Workfile...** from the main menu.

Examining the Data

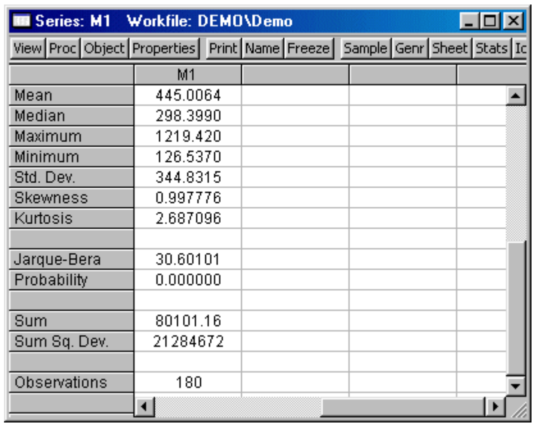
Now that you have your data in an EViews workfile, you may use basic EViews tools to examine the data in your series and groups in a variety of ways.

First, we examine the characteristics of individual series. To see the contents of the M1 series, simply double click on the M1 icon in the workfile window, or select **Quick/Show…** in the main menu, enter `m1`, and click **OK**.



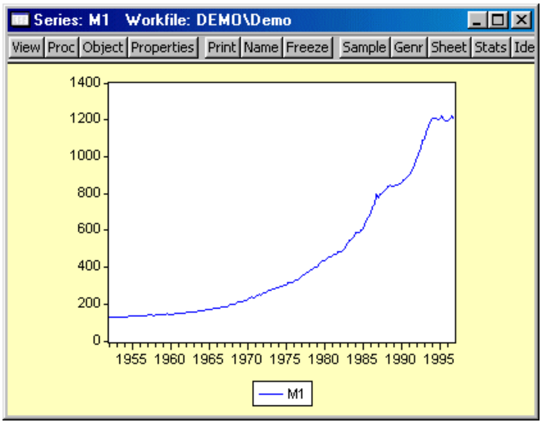
EViews will open the M1 series object and will display the default spreadsheet view of the series. Note the description of the contents of the series ("Series: M1") in the upper leftmost corner of the series window toolbar, indicating that you are working with the M1 series.

You will use the entries in the **View** and **Proc** menus to examine various characteristics of the series. Simply click on the buttons on the toolbar to access these menu entries, or equivalently, select **View** or **Proc** from the main menu.



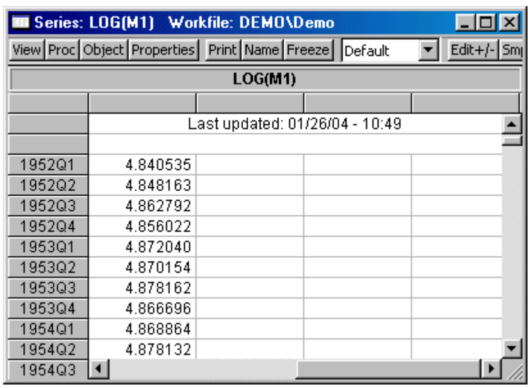
To compute, for example, a table of basic descriptive statistics for M1, simply click on the **View** button, then select **Descriptive Statistics/ Stats Table**. EViews will compute descriptive statistics for M1 and change the series view to display a table of results.

Similarly, to examine a line graph of the series, simply select **View/Graph/Line**. EViews will change the M1 series window to display a line graph of the data in the M1 series.



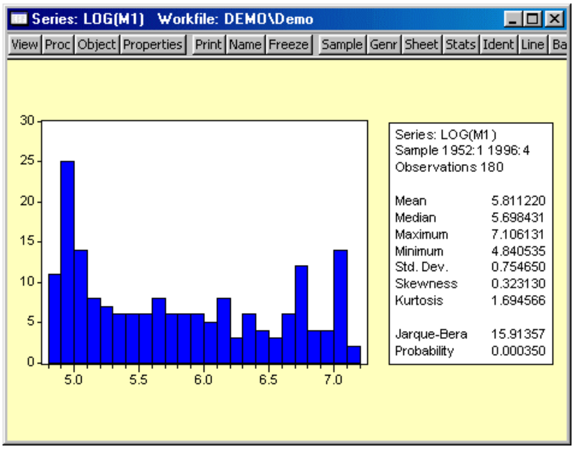
At this point, you may wish to explore the contents of the **View** and **Proc** menus in the M1 series window to see the various tools for examining and working with series data. You may always return to the spreadsheet view of your series by selecting **View/Spreadsheet** from the toolbar or main menu.

Since our ultimate goal is to perform regression analysis with our data expressed in natural logarithms, we may instead wish to work with the log of M1. Fortunately, EViews allows you to work with expressions involving series as easily as you work with the series themselves. To open a series containing this expression, select **Quick/Show…** from the main menu, enter the text for the expression, `log(m1)`, and click **OK**. EViews will open a series window for containing LOG(M1). Note that the titlebar for the series shows that we are working with the desired expression.

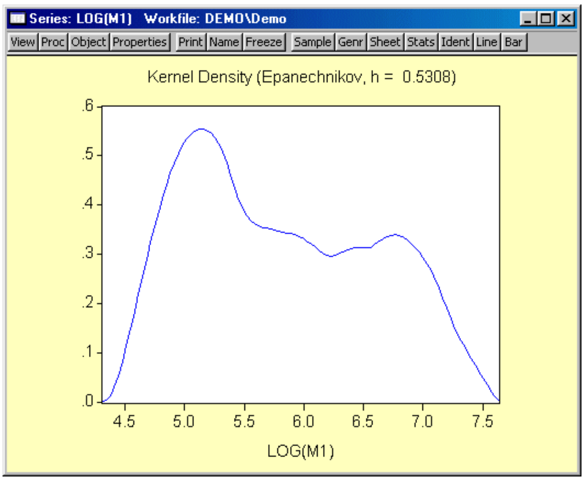


You may work with this auto-series in exactly the same way you worked with M1 above. For example, clicking on **View** in the series toolbar and selecting **Descriptive Statistics/**

Histogram and Stats displays a view containing a histogram and descriptive statistics for LOG(M1):



Alternately, we may display a smoothed version of the histogram by selecting **View/Distribution Graphs/Kernel Density…** and clicking on **OK** to accept the default options:

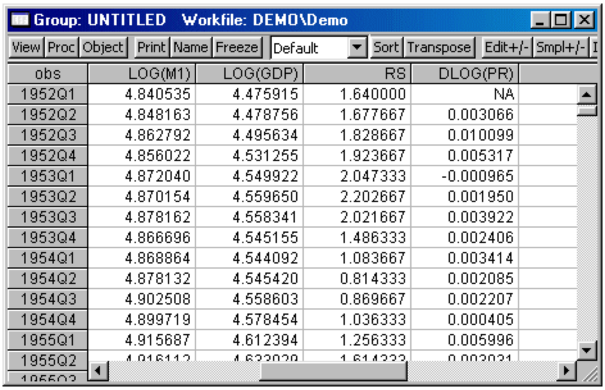


Suppose that you wish to examine multiple series or series expressions. To do so, you will need to construct a group object that contains the series of interest.

Earlier, you worked with an EViews created group object containing all of the series read from your Excel file. Here, we will construct a group object containing expressions involving a subset of those series. We wish to create a group object containing the logarithms of the series M1 and GDP, the level of RS, and the first difference of the logarithm of the series PR. Simply select **Quick/Show...** from the main EViews menu, and enter the list of expressions and series names:

```
log(m1) log(gdp) rs dlog(pr)
```

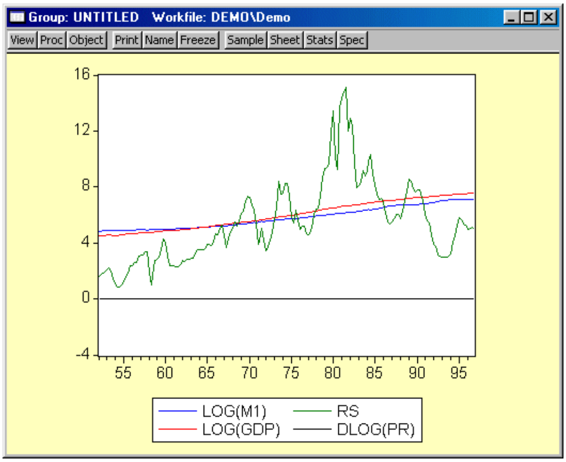
Click on **OK** to accept the input. EViews will open a group window containing a spreadsheet view of the series and expressions of interest.



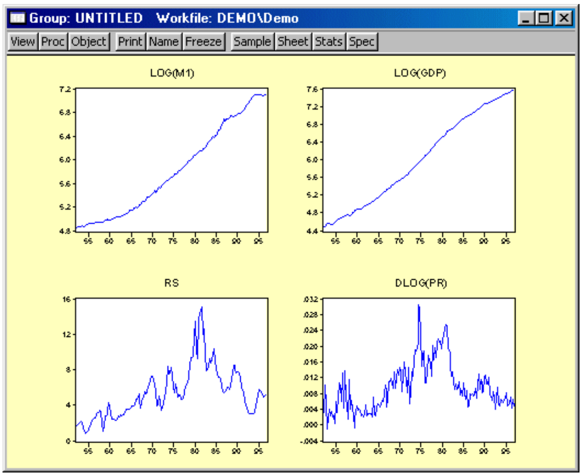
obs	LOG(M1)	LOG(GDP)	RS	DLOG(PR)
1952Q1	4.840535	4.475915	1.640000	NA
1952Q2	4.848163	4.478756	1.677667	0.003066
1952Q3	4.862792	4.495634	1.828667	0.010099
1952Q4	4.856022	4.531255	1.923667	0.005317
1953Q1	4.872040	4.549922	2.047333	-0.000965
1953Q2	4.870154	4.559650	2.202667	0.001950
1953Q3	4.878162	4.558341	2.021667	0.003922
1953Q4	4.866696	4.545155	1.486333	0.002406
1954Q1	4.868864	4.544092	1.083667	0.003414
1954Q2	4.878132	4.545420	0.814333	0.002085
1954Q3	4.902508	4.558603	0.869667	0.002207
1954Q4	4.899719	4.578454	1.036333	0.000405
1955Q1	4.915687	4.612394	1.256333	0.005996
1955Q2	[illegible]	[illegible]	[illegible]	[illegible]

As with the series object, you will use the **View** and **Proc** menus of the group to examine various characteristics of the group of series. Simply click on the buttons on the toolbar to access these menu entries or select **View** or **Proc** from the main menu to call up the relevant entries. Note that the entries for a group object will differ from those for a series object since the kinds of operations you may perform with multiple series differ from the types of operations available when working with a single series.

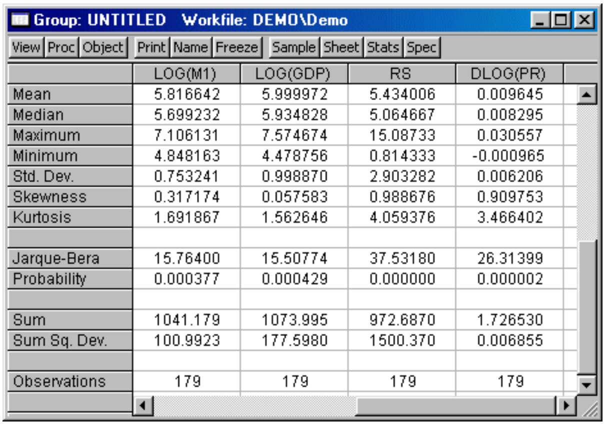
For example, you may select **View/Graphs/Line** from the group object toolbar to display a single graph containing line plots of each of the series in the group:



Alternately, you may select **View/Multiple Graphs/Line** to display the same information, but with each series expression plotted in an individual graph:



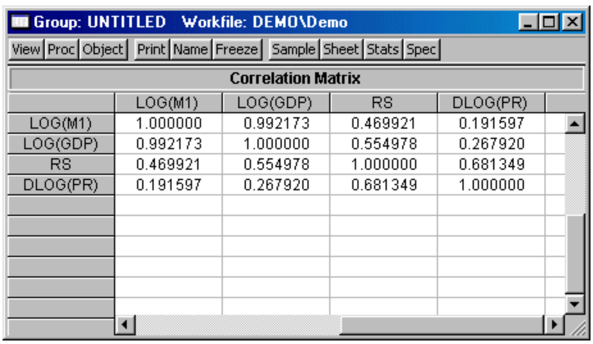
Likewise, you may select **View/Descriptive Stats/Individual Samples** to display a table of descriptive statistics computed for each of the series in the group:



	LOG(M1)	LOG(GDP)	RS	DLOG(PR)
Mean	5.816642	5.999972	5.434006	0.009645
Median	5.699232	5.934828	5.064667	0.008295
Maximum	7.106131	7.574674	15.08733	0.030557
Minimum	4.848163	4.478756	0.814333	-0.000965
Std. Dev.	0.753241	0.998870	2.903282	0.006206
Skewness	0.317174	0.057583	0.988676	0.909753
Kurtosis	1.691867	1.562646	4.059376	3.466402
Jarque-Bera	15.76400	15.50774	37.53180	26.31399
Probability	0.000377	0.000429	0.000000	0.000002
Sum	1041.179	1073.995	972.6870	1.726530
Sum Sq. Dev.	100.9923	177.5980	1500.370	0.006855
Observations	179	179	179	179

Note that the number of observations used for computing descriptive statistics for DLOG(PR) is one less than the number used to compute the statistics for the other expressions. By electing to compute our statistics using “Individual Samples”, we informed EViews that we wished to use the series specific samples in each computation, so that the loss of an observation in DLOG(PR) to differencing should not affect the samples used in calculations for the remaining expressions.

We may instead choose to use “Common Samples” so that observations are only used if the data are available for all of the series in the group. Click on **View/Correlations/Common Samples** to display the correlation matrix of the four series for the 179 common observations:



	LOG(M1)	LOG(GDP)	RS	DLOG(PR)
LOG(M1)	1.000000	0.992173	0.469921	0.191597
LOG(GDP)	0.992173	1.000000	0.554978	0.267920
RS	0.469921	0.554978	1.000000	0.681349
DLOG(PR)	0.191597	0.267920	0.681349	1.000000

Once again, we suggest that you may wish to explore the contents of the **View** and **Proc** menus for this group to see the various tools for examining and working with sets of series You can always return to the spreadsheet view of the group by selecting **View/Spreadsheet**.

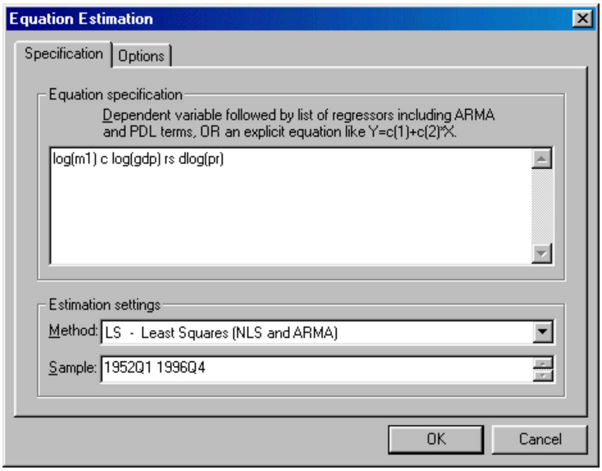
Estimating a Regression Model

We now estimate a regression model for M1 using data over the period from 1952Q1–1992Q4 and use this estimated regression to construct forecasts over the period 1993Q1–2003Q4. The model specification is given by:

$$\log(M1_t) = \beta_1 + \beta_2 \log(\mathrm{GDP}_t) + \beta_3 \mathrm{RS}_t + \beta_4 \Delta\log(\mathrm{PR}_t) + \epsilon_t \qquad (2.1)$$

where log(M1) is the logarithm of the money supply, log(GDP) is the log of income, RS is the short term interest rate, and $\Delta\log(\mathrm{PR})$ is the log first difference of the price level (the approximate rate of inflation).

To estimate the model, we will create an equation object. Select **Quick** from the main menu and choose **Estimate Equation…** to open the estimation dialog. Enter the following equation specification:



Here we list the expression for the dependent variable, followed by the expressions for each of the regressors, separated by spaces. The built-in series name C stands for the constant in the regression.

The dialog is initialized to estimate the equation using the **LS - Least Squares** method for the sample 1952Q1 1996Q4. You should change text in the **Sample** edit box to “1952Q1 1992Q4” to estimate the equation for the subsample of observations.

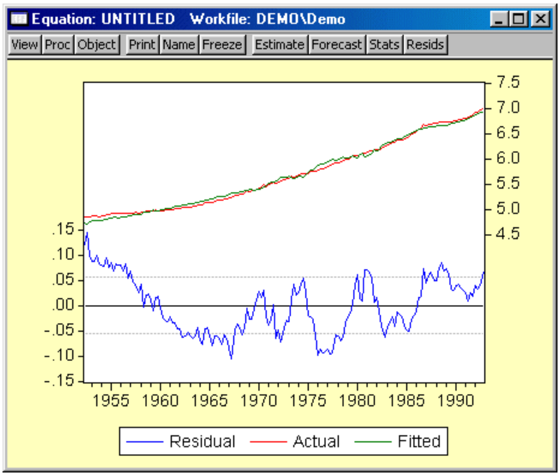
Click **OK** to estimate the equation using least squares and to display the regression results:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 01/26/04 Time: 13:55
Sample (adjusted): 1952Q2 1992Q4
Included observations: 163 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.312383	0.032199	40.75850	0.0000
LOG(GDP)	0.772035	0.006537	118.1092	0.0000
RS	-0.020686	0.002516	-8.221196	0.0000
DLOG(PR)	-2.572204	0.942556	-2.728967	0.0071

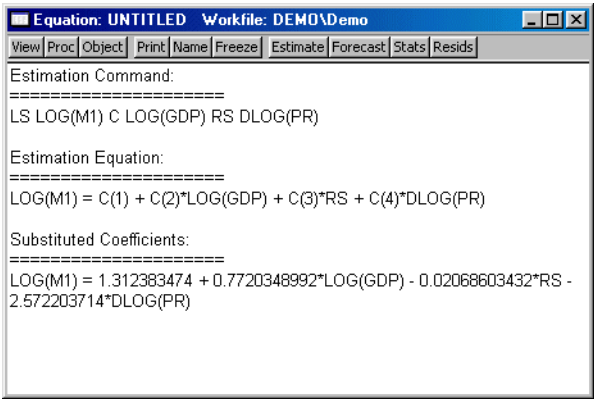
R-squared	0.993274	Mean dependent var	5.692279
Adjusted R-squared	0.993147	S.D. dependent var	0.670253
S.E. of regression	0.055485	Akaike info criterion	-2.921176
Sum squared resid	0.489494	Schwarz criterion	-2.845256
Log likelihood	242.0759	F-statistic	7826.904
Durbin-Watson stat	0.140967	Prob(F-statistic)	0.000000

Note that the equation is estimated from 1952Q2 to 1992Q4 since one observation is dropped from the beginning of the estimation sample to account for the DLOG difference term. The estimated coefficients are statistically significant, with *t*-statistic values well in excess of 2. The overall regression fit, as measured by the R^2 value, indicates a very tight fit. You can select **View/Actual, Fitted, Residual/Graph** in the equation toolbar to display a graph of the actual and fitted values for the dependent variable, along with the residuals:



Specification and Hypothesis Tests

We can use the estimated equation to perform hypothesis tests on the coefficients of the model. For example, to test the hypothesis that the coefficient on the price term is equal to 2, we will perform a Wald test. First, determine the coefficient of interest by selecting **View/Representations** from the equation toolbar:



Note that the coefficients are assigned in the order that the variables appear in the specification so that the coefficient for the PR term is labeled C(4). To test the restriction on C(4) you should select **View/Coefficient Tests/Wald–Coefficient Restrictions...**, and enter the restriction `c(4)=2`. EViews will report the results of the Wald test:

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	23.53081	(1, 159)	0.0000
Chi-square	23.53081	1	0.0000

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
-2 + C(4)	-4.572204	0.942556

Restrictions are linear in coefficients.

The low probability values indicate that the null hypothesis that C(4) = 2 is strongly rejected.

We should, however, be somewhat cautious of accepting this result without additional analysis. The low value of the Durbin-Watson statistic reported above is indicative of the presence of serial correlation in the residuals of the estimated equation. If uncorrected, serial correlation in the residuals will lead to incorrect estimates of the standard errors, and invalid statistical inference for the coefficients of the equation.

The Durbin-Watson statistic can be difficult to interpret. To perform a more general Breusch-Godfrey test for serial correlation in the residuals, select **View/Residual Tests/ Serial Correlation LM Test…** from the equation toolbar, and specify an order of serial correlation to test against. Entering 1 yields a test against first-order serial correlation:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	813.0060	Probability	0.000000
Obs*R-squared	136.4770	Probability	0.000000

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/26/04 Time: 14:16
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006355	0.013031	-0.487683	0.6265
LOG(GDP)	0.000997	0.002645	0.376929	0.7067
RS	-0.000567	0.001018	-0.556748	0.5785
DLOG(PR)	0.404143	0.381676	1.058864	0.2913
RESID(-1)	0.920306	0.032276	28.51326	0.0000

R-squared	0.837282	Mean dependent var	5.13E-16
Adjusted R-squared	0.833163	S.D. dependent var	0.054969
S.E. of regression	0.022452	Akaike info criterion	-4.724644
Sum squared resid	0.079649	Schwarz criterion	-4.629744
Log likelihood	390.0585	F-statistic	203.2515
Durbin-Watson stat	1.770965	Prob(F-statistic)	0.000000

The top part of the output presents the test statistics and associated probability values. The test regression used to carry out the test is reported below the statistics.

The statistic labeled “Obs*R-squared” is the LM test statistic for the null hypothesis of no serial correlation. The (effectively) zero probability value strongly indicates the presence of serial correlation in the residuals.

Modifying the Equation

The test results suggest that we need to modify our original specification to take account of the serial correlation.

One approach is to include lags of the independent variables. To add variables to the existing equation, click on the **Estimate** button in the equation toolbar and edit the specification to include lags for each of the original explanatory variables:

```
log(m1) c log(gdp) rs dlog(pr) log(m1(-1)) log(gdp(-1)) rs(-1)
    dlog(pr(-1))
```

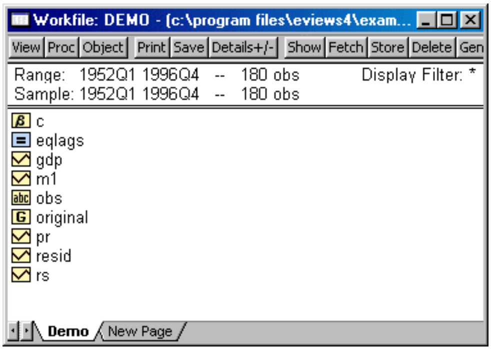
Note that lags are specified by including a negative number, enclosed in parentheses, following the series name. Click on **OK** to estimate the new specification and to display the results:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 01/26/04 Time: 14:17
Sample (adjusted): 1952Q3 1992Q4
Included observations: 162 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.071297	0.028248	2.523949	0.0126
LOG(GDP)	0.320338	0.118186	2.710453	0.0075
RS	-0.005222	0.001469	-3.554801	0.0005
DLOG(PR)	0.038615	0.341619	0.113036	0.9101
LOG(M1(-1))	0.926640	0.020319	45.60375	0.0000
LOG(GDP(-1))	-0.257364	0.123264	-2.087910	0.0385
RS(-1)	0.002604	0.001574	1.654429	0.1001
DLOG(PR(-1))	-0.071650	0.347403	-0.206246	0.8369

R-squared	0.999604	Mean dependent var	5.697490
Adjusted R-squared	0.999586	S.D. dependent var	0.669011
S.E. of regression	0.013611	Akaike info criterion	-5.707729
Sum squared resid	0.028531	Schwarz criterion	-5.555255
Log likelihood	470.3261	F-statistic	55543.30
Durbin-Watson stat	2.393764	Prob(F-statistic)	0.000000

Note that EViews has automatically adjusted the estimation sample to accommodate the additional lagged variables. We will save this equation in the workfile for later use. Press the **Name** button in the toolbar and name the equation EQLAGS.



The EQLAGS equation object will be placed in the workfile.

One common method of accounting for serial correlation is to include autoregressive (AR) and/or moving average (MA) terms in the equation. To estimate the model with an AR(1) error specification, you should make a copy of the EQLAGS equation by clicking **Object/ Copy Object…** in the EQLAGS window. EViews will create a new untitled equation containing all of the information from the previous equation. Press **Estimate** on the toolbar of the copy and modify the specification to read

```
log(m1) c log(gdp) rs dlog(pr) ar(1)
```

This specification removes the lagged terms, replacing them with an AR(1) specification:

$$\begin{aligned} \log(M1_t) &= \beta_1 + \beta_2 \log(\mathrm{GDP}_t) + \beta_3 \mathrm{RS}_t + \beta_4 \Delta\log(\mathrm{PR}_t) + u_t \\ u_t &= \rho u_{t-1} + \epsilon_t \end{aligned} \tag{2.2}$$

Click **OK** to accept the new specification. EViews will estimate the equation and will report the estimation results, including the estimated first-order autoregressive coefficient of the error term:

Dependent Variable: LOG(M1)
Method: Least Squares
Date: 01/26/04 Time: 17:21
Sample (adjusted): 1952Q3 1992Q4
Included observations: 162 after adjusting endpoints
Convergence achieved after 17 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.050283	0.328313	3.199031	0.0017
LOG(GDP)	0.794937	0.049332	16.11418	0.0000
RS	-0.007395	0.001457	-5.075131	0.0000
DLOG(PR)	-0.008018	0.348689	-0.022996	0.9817
AR(1)	0.968109	0.018189	53.22351	0.0000

R-squared	0.999526	Mean dependent var	5.697490
Adjusted R-squared	0.999514	S.D. dependent var	0.669011
S.E. of regression	0.014751	Akaike info criterion	-5.564584
Sum squared resid	0.034164	Schwarz criterion	-5.469288
Log likelihood	455.7313	F-statistic	82748.93
Durbin-Watson stat	2.164286	Prob(F-statistic)	0.000000

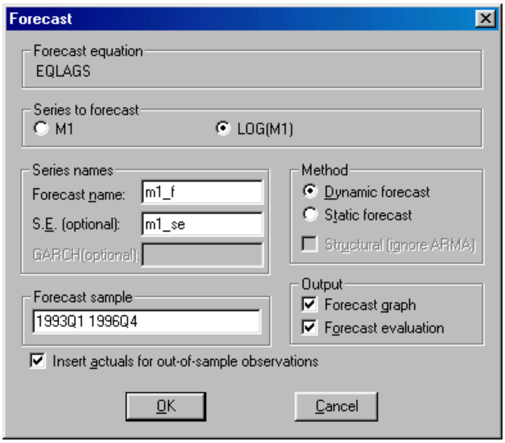
Inverted AR Roots .97

The fit of the AR(1) model is roughly comparable to the lag model, but its somewhat higher values for both the Akaike and the Schwarz information criteria indicate that the previous lag model may be preferred. Accordingly, we will work with the lag model in EQLAGS for the remainder of the demonstration.

Forecasting from an Estimated Equation

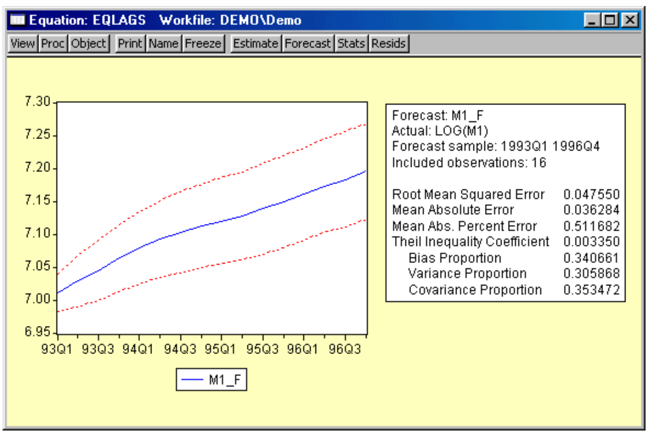
We have been working with a subset of our data, so that we may compare forecasts based upon this model with the actual data for the post-estimation sample 1993Q1–1996Q4.

Click on the **Forecast** button in the EQLAGS equation toolbar to open the forecast dialog:

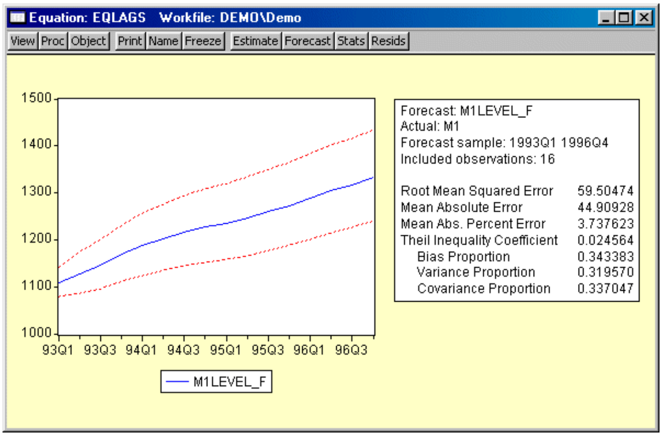


We set the forecast sample to 1993Q1–1996Q4 and provide names for both the forecasts and forecast standard errors so both will be saved as series in the workfile. The forecasted values will be saved in M1_F and the forecast standard errors will be saved in M1_SE.

Note also that we have elected to forecast the log of M1, not the level, and that we request both graphical and forecast evaluation output. The **Dynamic** option constructs the forecast for the sample period using only information available at the beginning of 1993Q1. When you click **OK**, EViews displays both a graph of the forecasts, and statistics evaluating the quality of the fit to the actual data:



Alternately, we may also choose to examine forecasts of the level of M1. Click on the **Forecast** button in the EQLAGS toolbar to open the forecast dialog, and select **M1** under the **Series to forecast** option. Enter a new name to hold the forecasts, say M1LEVEL_F, and click **OK**. EViews will present a graph of the forecast of the level of M1, along with the asymmetric confidence intervals for this forecast:

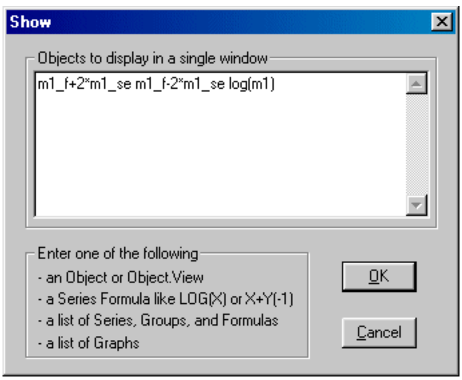


The series that the forecast procedure generates are ordinary EViews series that you may work with in the usual ways. For example, we may use the forecasted series for LOG(M1) and the standard errors of the forecast to plot actuals against forecasted values with (approximate) 95% confidence intervals for the forecasts.

We will first create a new group object containing these values. Select **Quick/Show...** from the main menu, and enter the expressions:

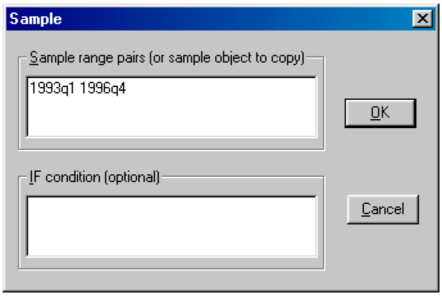
```
m1_f+2*m1_se m1_f-2*m1_se log(m1)
```

to create a group containing the confidence intervals for the forecast of LOG(M1) and the actual values of LOG(M1):

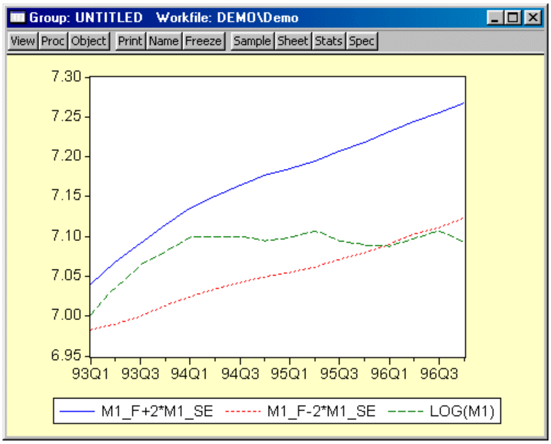


There are three expressions in the dialog. The first two represent the upper and lower bounds of the (approximate) 95% forecast interval as computed by evaluating the values of the point forecasts plus and minus two times the standard errors. The last expression represents the actual values of the dependent variable.

When you click **OK**, EViews opens an untitled group window containing a spreadsheet view of the data. Before plotting the data, we will change the sample of observations so that we only plot data for the forecast sample. Select **Quick/Sample…** or click on the **Sample** button in the group toolbar, and change the sample to include only the forecast period:



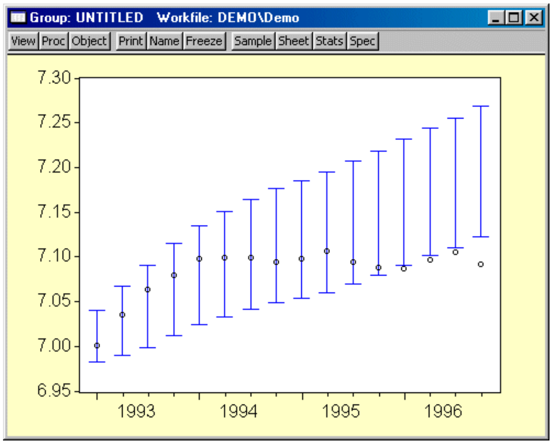
To plot the data for the forecast period, select **View/Graph/Line** from the group window:



The actual values of log(M1) are within the forecast interval for most of the forecast period, but fall below the lower bound of the 95% confidence interval beginning in 1996:1.

For an alternate view of these data, you can select **View/Graph/Error Bar**, which displays the graph as follows:

This graph shows clearly that the forecasts of LOG(M1) over-predict the actual values in the last four quarters of the forecast period.



Additional Testing

Note that the above specification has been selected for illustration purposes only. Indeed, performing various specification tests on EQLAGS suggests that there may be a number of problems with the existing specification.

For one, there is quite a bit of serial correlation remaining even after estimating the lag specification. A test of serial correlation in the EQLAGS equation (by selecting **View/ Residual Tests/Serial Correlation LM Test…**, and entering 1 for the number of lags) rejects the null hypothesis of no serial correlation in the reformulated equation:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	7.880369	Probability	0.005648
Obs*R-squared	7.935212	Probability	0.004848

Moreover, there is strong evidence of autoregressive conditional heteroskedasticity (ARCH) in the residuals. Select **View/Residual Tests/ARCH LM Test…** and accept the default of 1. The ARCH test results strongly suggest the presence of ARCH in the residuals:

ARCH Test:

F-statistic	11.21965	Probability	0.001011
Obs*R-squared	10.61196	Probability	0.001124

In addition to serial correlation and ARCH, there is an even more fundamental problem with the above specification since, as the graphs attest, LOG(M1) exhibits a pronounced upward trend, suggesting that we should perform a unit root in this series. The presence of a unit root will indicate the need for further analysis.

We once again display the LOG(M1) series window by clicking on **Window** and selecting the LOG(M1) series window from the menu. If the series window for LOG(M1) is not present (if you previously closed the window), you may again open a new window by selecting **Quick/Show…**, entering `log(m1)`, and clicking **OK**.

Before computing the test statistic, we will reset the workfile sample to all of the observations by clicking on Quick/Sample... and entering `@all` in the dialog.

Next, to perform an Augmented Dickey-Fuller (ADF) test for nonstationarity of this series, select **View/Unit Root Test...** and click on **OK** to accept the default options. EViews will perform an ADF test and display the test results. The top portion of the output reads:

Null Hypothesis: LOG(M1) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.684205	0.0157
Test critical values:	1% level	-3.920350	
	5% level	-3.065585	
	10% level	-2.673459	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 16

EViews performs the ADF test statistic with the number of lagged difference terms in the test equation (here, zero) determined by automatic selection. The ADF test statistic value has a probability value of 0.0157, providing evidence that we may reject the null hypothesis of a unit root.

If a unit root were present in our data, we may wish to adopt more sophisticated statistical models. These techniques are discussed in Chapter 17, “Time Series Regression” and Chapter 24, “Vector Autoregression and Error Correction Models” which deal with basic time series and vector autoregression and vector error correction specifications, respectively.