

Lab 1 Econ 581

Scott Payseur (spayseur@u.washington.edu)

University of Washington, Department of Economics

1 Eviews

Eviews is a canned econometrics package. Canned meaning it can perform the common econometric techniques with ease. This is great if you want to perform common econometric techniques. Contrary to popular belief it actually allows you to perform some programming, including loops and conditionals (if then else statements). However, the programming that you will be doing in this class will be done in Matlab because Matlab is a matrix programming language. So it will be simple in Matlab to code $(X'X)^{-1}X'y$, etc. The reason that we are learning Eviews 5.0¹ as well is two fold. First, when we have a simple econometrics task it will be easy to open Eviews and complete it. Second, when we are writing a program, say to calculate the estimate of $\hat{\beta}$ the best way to verify the programs accuracy is to use a canned package that has been tested extensively.

1.1 Using Eviews

Below is a demonstration of very little of the features of Eviews. (Enough to do hw 1). Each week we will add to our knowledge of econometrics, Eviews and Matlab².

1.1.1 Opening an Eviews file

One of the most frustrating things about using different econometric packages is lack of compatibility of the file formats; Eviews files will not open in Matlab or Excel, etc. Because of this I am going to help you with the first few datasets and we will learn the nuances to data transformation later in the quarter. Go to <http://students.washington.edu/spayseur/econ581.wi06/lab/1> to find the eviews workfile for this exercise. Save this file to the hard drive (probably c:/temp today). Open Eviews and then go to *File* → *Open* → *Eviews workfile...*

1.1.2 Looking at the Data

When you opened the file you should see the data. This is a dataset of median home prices (*MHP*) and mortgage interest rates (*INT*) for the period 1994-2003.

Basic Stats In order to see the basic stats for column of the data doubleclick on that column of data. This will give you a spreadsheet view of the data. Go to *View* → *Descriptive Statistics* to see the descriptive stats for this column.

Plotting *View* → *Graph* → *Line*

Scatter Click on both columns of data and the right click on them and *Open as Series*. Then go to *View* → *Multiple Graphs* → *Scatter*

¹ Eviews < 5.0 is a challenge to use as compared to 5.0. Mostly because of data import issues. I would strongly recommend that you use 5.0 if you can.

² IF YOU DON'T UNDERSTAND THIS WEEK THEN ASK!

1.1.3 Running an OLS Regression

Eviews commands can be performed on the command line (at the top of the screen) or using the GUI interface with drop down menus, etc. The drop down menus are self explanatory so I will not discuss that here, it seems that most people use the command line for simple things such as a regression. Let's look at the following model:

$$MHP_t = \beta_1 + \beta_2 INT_t + u_t$$

To run this regression in Eviews we use the following command:

LS MHP C INT

1.1.4 Residuals

Once we run the regression and the model screen pops up we can look at the residuals: *View* → *Actual, Fitted, Residuals...* → *Residual Graph*

1.1.5 Changing the sample

If we want to look at a subsample of the data then we can use the *smp* command. Let's say we want to look at 1990 - 1998:

smp 1990 1998

1.1.6 Generating Data

The *series* command helps us generate new series. This is helpful for simulation in Eviews. For example if we want to generate a new series that is $INT + 2$

series INT2 = INT + 2

1.1.7 Generating Psuedo Random Numbers

For simulation purposes, such as hw 1, we will need to generate random numbers from a particular distribution.

- Standard Normal³ (ie $N(0,1)$) - *series mynormal = @rnorm*
- Student's t (3 dof)- *series myt = @rtdist(3)*
- Uniform - *series myuniform = @rnd*

Look at the help file for others.

2 Matlab

Matlab is a matrix programming language that also contains the features of most programming language. It is a scripted language instead of a compiled language. Below are a few commands to start with.

³ Remember $Z = \frac{X-\mu}{\sigma} \Rightarrow X = \sigma Z + \mu$

2.1 Importing data

Importing data is a little strange with Matlab. You want to have the data in a matrix. You can download the .m file from the lab 1 on my webpage. You can then copy that data and paste it into the Command Window. On the left you can see that there is a new data object in your Workspace. This is a matrix named `housing_data` that is 16x2.

2.2 Looking at the Data

If you right click on the matrix in your Workspace then you can select a particular type of graph to see.

2.3 Accessing Data in a Matrix

To access data in a matrix we use the following in the Commands. (Remember we do rows first... our `housing_data` file is 16x2 which means it has 16 rows and 2 columns.

- Accessing a single element: `housing_data(1,1)`
- First two rows, first column: `housing_data(1:2,1)`
- First two rows, first two columns: `housing_data(1:2,1:2)`
- All rows, first column: `housing_data(:,1)`

2.4 Transposing Matrix

- `housing_data'`

2.5 Inverting Matrix

- `inv(housing_data)`

2.6 Multiplication, Addition, Subtraction of Matrix

- `housing_data' * housing_data` (remember your matrix dimensions must agree)
- `housing_data + housing_data`
- `housing_data - housing_data`

2.7 Ones and Zeros Matrices

- `ones(10,5)` - creates a 10x5 matrix of all ones
- `zeros(10,5)`-creates a 10x5 matrix of all zeros
- `eye(3)`- creates a 3x3 matrix with ones on the diag and zeros everywhere else

2.8 Random Variables

- `randn(3,6)` - Creates 3x6 matrix of $N(0,1)$
- Other distributions TBA

2.9 OLS Estimate of $\hat{\beta}$

1. Create your X matrix:

(a) $X = [\text{ones}(16, 1) \text{ housing_data}(:, \text{int})];$ ⁴

(b) Check your Workspace to verify that this was created.

2. Create your Y matrix:

(a) $y = \text{housing_data}(:, \text{mhp});$

3. Create $\beta = (X'X)^{-1}X'y$

(a) $\text{beta_hat} = \text{inv}(X' * X) * X' * y$

4. Let's say you want to compute the regression function using your estimates for the coefficients now. ($X\hat{\beta}$)

(a) $X * \text{beta_hat}$

3 UW Account

UW gives you 100 MB of space⁵ on their student servers. This space is allocated for email files, web files and your personal files. This means that you can save your work to their backed up servers. And access them from anywhere there is internet⁶.

3.1 Open Secure FTP Software

SSH Secure File Transfer

3.2 Connect

1. Click on Quick Connect
2. Host Name: *dante.u.washington.edu*
3. User Name: *your email username*
4. Password: *your email password*

3.3 Create folder

Right click on your UW account and create a new folder. You can now drag your work from c:/temp to this folder and access it from everywhere⁷.

4 Econ Account (Econ students only)

The econ students can save files to their econ folders (the ones you have in the lab) the only thing that is different is the hostname is *gradfs.soc.washington.edu* and your username and password is the one you use in the econ lab.

⁴ The semicolon is not needed in matlab, however if you have it then the result of the command is not printed to the screen. This means that if you want something printed to the screen you do not need to use a special print command, just omit the semicolon.

⁵ If you send an email to the computer department you can request 100 MB more for no charge.

⁶ You must have the uwick kit installed (<http://www.washington.edu/computing/software/uwick/>) or some other secure ftp program.

⁷ I have now told you how to save a file where your dog cannot eat it. So no excuses.

5 Turning in Homework

You can do the computer part homework with L^AT_EX, Word, Open Word or whatever you want. Most of you will use Microsoft Word. Two words of caution:

1. If you are pasting a figure from Matlab or Eviews into a word document use *paste special* → *as image* sometimes the graphics are not treated as images so one image can be 1MB or larger. If you are having problems with huge .doc files you might want to try this.
2. SAVE OFTEN! For some reason pasting Eviews into Word makes Word crash often. Save and then it will only be slightly annoying.