Computer Handout 3: Estimating a Regression Equation Diego Escobari Econ 3342

This Computed Handout 3 will cover the following points:

- 1) Scatterplots.
- 2) Linear regressions.

We will be using the data set Handout03 from the class website. The data set is already formatted for EViews (or gretl) and contains three variables; x, y and z:

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Range: 1 48 48 obs Sample: 1 48 48 obs	Display Filter: *
C	
resid	
✓ y ✓ z	
Xyz New Page	

Open variables x and y as a group:

ı⊈ c ⊠ resid ⊠ x			-		
MY MZZ	Open	•		as Group	
	Сору			as Equation	
< ∧ Xyz (Paste			as VAR	

Then select "Graph," "Scatter," and then "Scatter with Regression."

Group: UNTITLED Workfile: DAT	AHANDOUT03\Xyz	-			
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Group Members Spreadsheet Dated Data Table	Y 0518 3510		^		
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Multiple Graphs	Area				
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N-Way Tabulation	Scatter	+	Simple Scatter		
Correlations	XY line	•	Scatter with Regression		
Covariances Principal Components Correlogram (1)	Error Bar High-Low (Open-Close) Die		Scatter with Ne Scatter with Ke	arest Neighbor Fit rnel Fit	
	7040	_	XY Pairs		

and select the default options to obtain:



This is the same as Figure 2.2 in your textbook.

How is the linear regression line obtained? This is done easily by typing the following command: "LS Y C X Z." This is basically telling EViews to run a linear regression using Leas Squares (LS) with Y as the dependent variable and on a constant C and on variables X and Z:

🔛 E	Views											
<u>F</u> ile	<u>E</u> dit <u>O</u> b	ject <u>V</u>	liew	Proc	Quick	Options	Wind	low <u>I</u>	<u>H</u> elp			
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D	ate: 09/15	5/10 T	ime:	01:55	5							
S	ample: 1 4	18										=
Included observations: 48												
	Variable Coefficient Std. Error t-Statistic Prob		rob.									
	(C 9 884732 0 190297 51		51.	94359	0	.0000					
	X		X 1.073140		0.15	0.150341 7.138031		0	.0000			
	2	Z		-0.6	38011	0.17	0.172499 -3.698642		0	.0006		
R	B squared 0.552028 Mean dependent var 10.08241						08241					
	Adjusted R-squared		0.5	33059	SD (S D dependent var			1 90	18842		
s	E of real	ression	n 1	1.3	04371	Akaik	Akaike info criterion		3.42	29780		
S	um square	ed resi	d	76.	56223	Schw	Schwarz criterion		3.54	46730		
L	og likeliho	od	-	-79	31472	F-stat	F-statistic		27 8	32752		
D	urbin-Wa	tson st	at	1.5	06278	Prob(Prob(F-statistic)			0.00	00000	
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Notice that this is the same table as Table 2.1 from your textbook.

You can do the same in gretl by selecting both series, then RHS button on the mouse and finally "XY scatterplot."



To obtain:



The linear regression model can be estimated by selecting "Model," then "Ordinary Least Squares." Pick the following options in the next screen:

gretl: specify mo	del 📃 🗖 🗾 🗾							
OLS								
const	Dependent variable							
X	Y Y							
Υ	Set as default							
Z	Independent variables							
	→ x							
	Z							
	4							
Robust standard errors Configure								
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Help C	lear <u>C</u> ancel <u>O</u> K							

Regression output:

gretl: model 1						X		
<u>File Edit Tests Save G</u> r	aphs <u>A</u> nalysis <u>L</u> a	aTeX						
Model 1: OLS, using observations 1960-2007 (T = 48) Dependent variable: Y								
coeffi	cient std.	error	t-ratio	p-value				
const 9.88	473 0.1	90297	51.94	8.19e-042	2 ***			
X 1.07	314 0.1	50341	7.138	6.36e-09	***			
Z -0.63	8011 0.1	72499	-3.699	0.0006	***			
Mean dependent var	10.08241	S.D. d	lependent va	ir 1.9088	842			
Sum squared resid	76.56223	S.E. c	of regression	n 1.3043	371			
R-squared	0.552928	Adjust	ed R-square	ed 0.5330)59			
F(2, 45)	27.82752	P-valu	le(F)	1.36e-	-08			
Log-likelihood	-79.31472	Akaike	criterion	164.62	294			
Schwarz criterion	170.2430	Hannar	-Quinn	166.75	508			
rho	0.176685	Durbin	-Watson	1.5062	278			