

LAB1 - Exploring OLS Estimates in TSCS

```
. help xt
```

—Exceptionally useful starting point for exploring Stata’s explicitly “xt” (panel/tscs) designed features.

```
. use "C:[PATH]...\garmit_esspanel1.dta", clear
```

—These are data from Garrett & Mitchell: “Globalization, government spending and taxation in the OECD,” *European Journal of Political Research* 39(2) (2001): 145–177. Explore variable list.

```
. log using "...path...\basics1.log", append
```

—A good ideal to get in the habit of logging your work every session. You can always delete records later if you wish, but you cannot go back to create a log as easily from within a session and not at all once you’ve closed one.

```
. xtset
```

```
panel variable:  cc (strongly balanced)
time variable:  year, 1961 to 1994
delta:         1 unit
```

The 18 CC’s & Country’s are:

- | | | |
|--------------|-----------------|--------------------|
| 1. Australia | 7. France | 13. New Zealand |
| 2. Austria | 8. Germany | 14. Norway |
| 3. Belgium | 9. Ireland | 15. Sweden |
| 4. Canada | 10. Italy | 16. Switzerland |
| 5. Denmark | 11. Japan | 17. United Kingdom |
| 6. Finland | 12. Netherlands | 18. United States |

```
. reg spend unem growthpc depratio left cdem trade lowwage fdi
```

Source	SS	df	MS	Number of obs = 529		
Model	33411.5828	8	4176.44785	F(8, 520)	=	91.12
Residual	23834.1148	520	45.8348362	Prob > F	=	0.0000
-----+-----				R-squared	=	0.5837
Total	57245.6976	528	108.419882	Adj R-squared	=	0.5772
-----+-----				Root MSE	=	6.7701

spend	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
unem	.9320547	.0928529	10.04	0.000	.7496417	1.114468
growthpc	-.9012817	.1303971	-6.91	0.000	-1.157451	-.6451119
depratio	-.4446718	.1235697	-3.60	0.000	-.6874289	-.2019147
left	.058016	.0087215	6.65	0.000	.0408823	.0751497
cdem	.0287597	.0131838	2.18	0.030	.0028596	.0546597
trade	.1293114	.014866	8.70	0.000	.1001066	.1585163
lowwage	-.157155	.0478007	-3.29	0.001	-.2510612	-.0632488
fdi	.0927398	.2159476	0.43	0.668	-.3314971	.5169768
_cons	48.81442	4.943615	9.87	0.000	39.1025	58.52633

—One low-tech, but sometimes quite useful method is post-estimation graphical exploration of your estimates, your estimated residuals in particular. Stata has a number of built-in post-estimation tools for graphical exploration. See menu item: Statistics/Linear models and related/Regression diagnostics... You may also wish to create graphics related to your estimated residuals yourself. Useful for this are to create a variable like the following:

```
. predict e_FullPooledOLS, residuals
(83 missing values generated)
```

A simple line-plot of the residuals by country is now available thus:

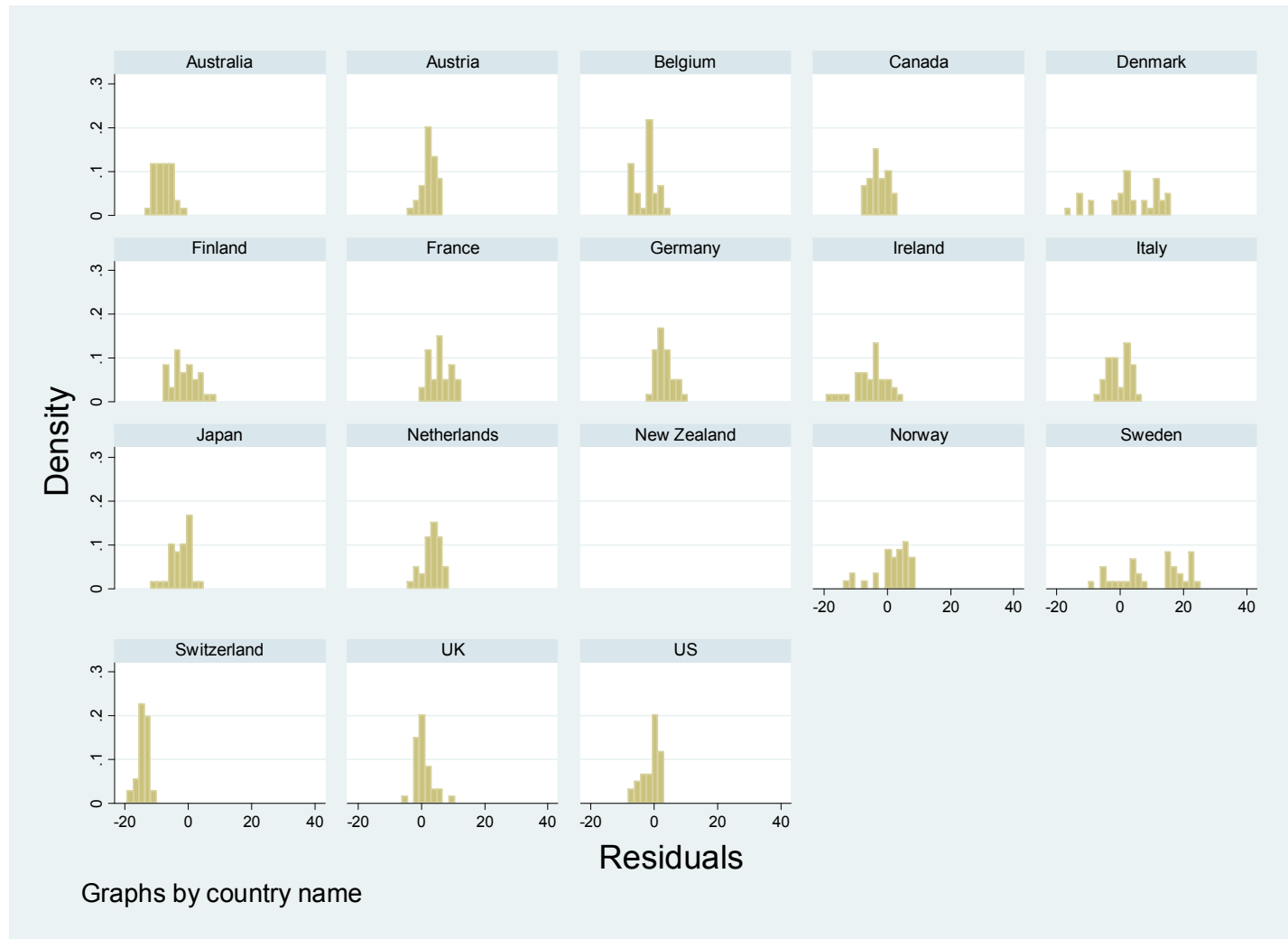
```
. xtline e_FullPooledOLS, i(country) t(year)
```



What patterns should you see in the means, trends, and spreads within and across units and over time?
What's wrong with these pictures?

Another useful plot for exploring residuals are histograms.

```
. histogram e_FullPooledOLS, by(cc)
```



What should we see here?

A similarly useful plot would be a box-and-whiskers by country.

Another useful variable to generate for post-estimation graphical and other exploration is this:

```
. gen e2_FullPooledOLS=e_FullPooledOLS^2  
(83 missing values generated)
```

What is this an estimate of?

How might you use e and/or e^2 to test for

- ...insufficiently modeled (orthogonal) country-specific factors? (i.e., the sufficiency of a common intercept?)
- ...heteroskedasticity that would bias OLS estimates of coefficient-estimate variance-covariance matrices?
- ...heteroskedasticity by country?
- ...(time-)serial correlation?

```
. estat ovtest
```

Claims to be a test for omitted variables. What is it? What does it actually test?

```
. estat hettest
```

HOMEWORK: Conduct some similar post-estimation graphical and statistical explorations with your dataset and bring a log or lab report.

Try this series of estimates:

```
reg spend unem growthpc depratio left cdem trade lowwage fdi
```

```
reg spend unem growthpc depratio left cdem trade lowwage fdi , vce(robust)
reg spend unem growthpc depratio left cdem trade lowwage fdi , vce(cluster cc)
```

What are these? What happens to your estimates of β ? What about of $V(\mathbf{b})$?

Try this series of estimates:

```
xtpcse spend unem growthpc depratio left cdem trade lowwage fdi , independent
xtpcse spend unem growthpc depratio left cdem trade lowwage fdi , hetonly
xtpcse spend unem growthpc depratio left cdem trade lowwage fdi
```

What are these? What happens to your estimates of β ? What about of $V(\mathbf{b})$?

One last set of estimates:

```
xtgls spend unem growthpc depratio left cdem trade lowwage fdi , p([i,h,c]) c([i,a,p])
```

What are these? What happens to your estimates of β ? What about of $V(\mathbf{b})$?