

Empirical Panel Data: Lecture 4

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A Stata example for FE model

- The data used in the following slides was extracted from Penn World Table 9.0. You can access the data through the following:
<https://www.rug.nl/ggdc/productivity/pwt/pwt-releases/pwt9.0?lang=en>
- Selected variables:
 - 1 **rgdpna**: Real GDP at constant 2011 national prices (in mil. 2011US\$)
 - 2 **ccon**: Real consumption of households and government, at current PPPs (in mil. 2011US\$)
 - 3 **ck**: Capital stock at current PPPs (in mil. 2011US\$)
 - 4 **pop**: Population (in millions)

A Stata example: Transform data

- Take log-transform on *level* variables:

```
gen lrgdpna = log(rgdpna)
```

...

- Afterward, we need to arrange the panel data according to the ID and time variable before proceeding to calculate the *growth rate* data:

```
encode country, gen(country1)
```

```
sort country1 year
```

- Then, we generate the lagged values:

```
by country1: gen lrgdpnalag = L.lrgdpna
```

...

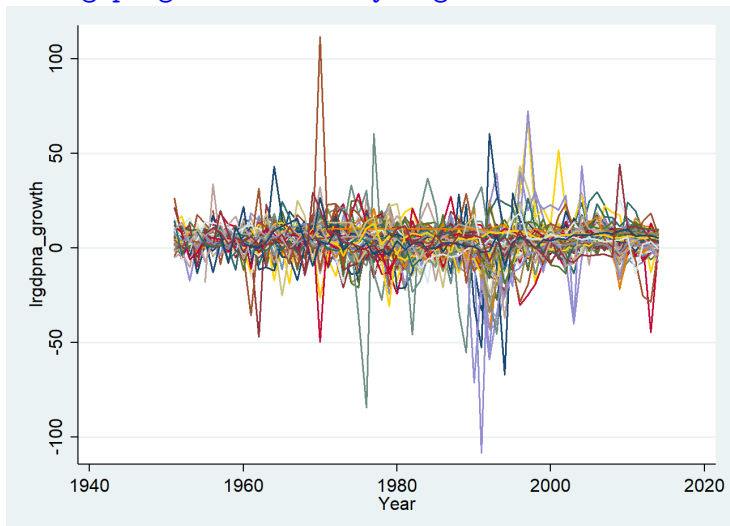
- Finally, we obtain the growth rate:

```
by country1: gen lrgdpnagrowth = (lrgdpna -  
lrgdpnalag) * 100 or by country1: gen rgdpnagrowth =  
(rgdpna - rgdpnalag) / rgdpnalag * 100
```

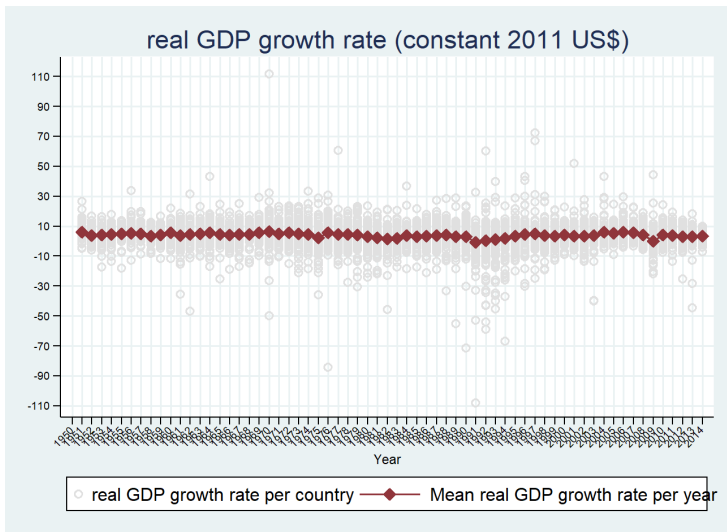
...

A Stata example: Plot the growth rate over time for each panel ID

- `xtline lrgdpna_growth, overlay legend(off)`



A Stata example: Plot the growth rate over time for each panel ID allowing heterogeneity across years



A Stata example: Summary the panel we used by heterogeneity of country and time

- `xtsum lrgdpnagrowth lccongrowth lckgrowth lpopgrowth`

Variable	Mean	Std. Dev.	Min	Max	Observations
lrgdpn~h overall	3.798374	6.598716	-108.2343	111.5274	N = 9257
between	1.75017	-1.815597	8.14533		n = 182
within	6.4109	-108.5582	107.7231		T-bar = 50.8626
lccon_~h overall	4.125728	8.748904	-115.134	112.3641	N = 9257
between	1.704594	-1.506313	9.914944		n = 182
within	8.617975	-115.1395	113.5708		T-bar = 50.8626
lck_gr~h overall	5.67216	6.426214	-89.27583	99.65	N = 9229
between	2.361506	-.4991015	16.80704		n = 180
within	6.070646	-90.57122	98.35461		T-bar = 51.2722
lpop_g~h overall	1.837424	1.619162	-19.90067	17.62477	N = 9257
between	1.336986	-1.875997	8.302443		n = 182
within	1.067418	-18.97248	13.67774		T-bar = 50.8626

A Stata example: Pooled panel regression

- `regress lrgdpnagrowth lccongrowth lckgrowth lpopgrowth, robust`

```
Linear regression                               Number of obs   =    9,229
                                                F(3, 9225)     =   110.44
                                                Prob > F       =    0.0000
                                                R-squared      =    0.3089
                                                Root MSE     =    5.4931
```

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
<code>lrgdpna_gr~h</code>						
<code>lccon_growth</code>	.3850562	.0278897	13.81	0.000	.3303862	.4397261
<code>lck_growth</code>	.0752964	.0197179	3.82	0.000	.0366449	.1139479
<code>lpop_growth</code>	.4073854	.0589489	6.91	0.000	.2918325	.5229383
<code>_cons</code>	1.040327	.1769163	5.88	0.000	.6935317	1.387122

A Stata example: Fixed effect regression

- `xtreg lrgdpnagrowth lccongrowth lckgrowth lpopgrowth, fe robust`

```
Fixed-effects (within) regression           Number of obs   =       9,229
Group variable: country1                   Number of groups =       180

R-sq:                                     Obs per group:
      within = 0.2920                      min =           24
      between = 0.5949                     avg =          51.3
      overall = 0.3069                     max =           64

corr(u_i, Xb) = 0.0110                     F(3,179)        =       38.68
                                           Prob > F         =       0.0000
```

(Std. Err. adjusted for 180 clusters in country1)

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
<code>lrgdpna_gr~h</code>						
<code>lccon_growth</code>	.3785448	.0390846	9.69	0.000	.3014189	.4556706
<code>lck_growth</code>	.0511562	.0312714	1.64	0.104	-.0105519	.1128643
<code>lpop_growth</code>	.566651	.1392458	4.07	0.000	.2918765	.8414254
<code>_cons</code>	.9113573	.3265125	2.79	0.006	.2670483	1.555666
<code>sigma_u</code>	1.1230599					
<code>sigma_e</code>	5.4526324					
<code>rho</code>	.04069581	(fraction of variance due to <code>u_i</code>)				