



MP - Parallel Edition

Copyright 1985-2015 StataCorp LP
 StataCorp
 4905 Lakeway Drive
 College Station, Texas 77845 USA
 800-STATA-PC <http://www.stata.com>
 979-696-4600 stata@stata.com
 979-696-4601 (fax)

Single-user 8-core Stata perpetual license:

Serial number: 10699393
 Licensed to: Wirinratch K
 TU

Notes:

1. Unicode is supported; see [help unicode advice](#).
2. More than 2 billion observations are allowed; see [help obs advice](#).
3. Maximum number of variables is set to 5000; see [help set_maxvar](#).

```
1 . use "/Users/mien/Downloads/assign7.dta"

2 . log using "/Users/mien/Desktop/ee426/assignment7_426.smcl"
```

```
    name: <unnamed>
    log:  /Users/mien/Desktop/ee426/assignment7_426.smcl
    log type: smcl
    opened on: 17 Mar 2021, 22:34:25
```

```
3 . xtset crossid year
    variable year not found
    r(111);

4 . xtset crossid time
    panel variable:  crossid (strongly balanced)
    time variable:  time, 40 to 44
                   delta: 1 year

5 . xtgls y x1 x2 x3 x4 x5 x6 x7
```

Cross-sectional time-series FGLS regression

Coefficients: **generalized least squares**
 Panels: **homoskedastic**
 Correlation: **no autocorrelation**

Estimated covariances	=	1	Number of obs	=	1,275
Estimated autocorrelations	=	0	Number of groups	=	255
Estimated coefficients	=	8	Time periods	=	5
			Wald chi2(7)	=	899.95
Log likelihood	=	209.4322	Prob > chi2	=	0.0000

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
x1	.0794732	.0093881	8.47	0.000	.0610728	.0978735
x2	.0183375	.0051421	3.57	0.000	.0082592	.0284158
x3	.0977707	.0526329	1.86	0.063	-.0053879	.2009293
x4	.0873838	.2186064	0.40	0.689	-.3410767	.5158444
x5	-.1076457	.0069214	-15.55	0.000	-.1212114	-.0940801
x6	-.1432493	.0186811	-7.67	0.000	-.1798637	-.106635
x7	-.2712849	.011995	-22.62	0.000	-.2947946	-.2477753
_cons	-.0107965	.0860341	-0.13	0.900	-.1794201	.1578272

```
6 . xtglsl y x1 x2 x3 x4 x5 x6 x7, igls panels(heteroskedastic)
```

```
Iteration 1: tolerance = .08868167
Iteration 2: tolerance = .05849043
Iteration 3: tolerance = .03525359
Iteration 4: tolerance = .02040677
Iteration 5: tolerance = .01187668
Iteration 6: tolerance = .00709681
Iteration 7: tolerance = .00441169
Iteration 8: tolerance = .00291535
Iteration 9: tolerance = .00321184
Iteration 10: tolerance = .00409533
Iteration 11: tolerance = .00580092
Iteration 12: tolerance = .00908183
Iteration 13: tolerance = .01574945
Iteration 14: tolerance = .02974716
Iteration 15: tolerance = .05103653
Iteration 16: tolerance = .04401112
Iteration 17: tolerance = .00723478
Iteration 18: tolerance = .00429598
Iteration 19: tolerance = .0028681
Iteration 20: tolerance = .00195025
Iteration 21: tolerance = .00134658
Iteration 22: tolerance = .00105022
Iteration 23: tolerance = .00117237
Iteration 24: tolerance = .00122304
Iteration 25: tolerance = .00122651
Iteration 26: tolerance = .00119949
Iteration 27: tolerance = .00115339
Iteration 28: tolerance = .00109594
Iteration 29: tolerance = .00103239
Iteration 30: tolerance = .00096626
Iteration 31: tolerance = .00089991
Iteration 32: tolerance = .0008349
Iteration 33: tolerance = .00077221
Iteration 34: tolerance = .00071245
Iteration 35: tolerance = .00065597
Iteration 36: tolerance = .00060292
Iteration 37: tolerance = .00055335
```

```

Iteration 90: tolerance = 3.084e-06
Iteration 91: tolerance = 2.786e-06
Iteration 92: tolerance = 2.517e-06
Iteration 93: tolerance = 2.274e-06
Iteration 94: tolerance = 2.054e-06
Iteration 95: tolerance = 1.855e-06
Iteration 96: tolerance = 1.676e-06
Iteration 97: tolerance = 1.514e-06
Iteration 98: tolerance = 1.368e-06
Iteration 99: tolerance = 1.235e-06
Iteration 100: tolerance = 1.116e-06
Iteration 101: tolerance = 1.008e-06
Iteration 102: tolerance = 9.105e-07
Iteration 103: tolerance = 8.224e-07
Iteration 104: tolerance = 7.428e-07
Iteration 105: tolerance = 6.710e-07
Iteration 106: tolerance = 6.060e-07
Iteration 107: tolerance = 5.474e-07
Iteration 108: tolerance = 4.944e-07
Iteration 109: tolerance = 4.466e-07
Iteration 110: tolerance = 4.034e-07
Iteration 111: tolerance = 3.643e-07
Iteration 112: tolerance = 3.291e-07
Iteration 113: tolerance = 2.972e-07
Iteration 114: tolerance = 2.684e-07
Iteration 115: tolerance = 2.425e-07
Iteration 116: tolerance = 2.190e-07
Iteration 117: tolerance = 1.978e-07
Iteration 118: tolerance = 1.786e-07
Iteration 119: tolerance = 1.613e-07
Iteration 120: tolerance = 1.457e-07
Iteration 121: tolerance = 1.316e-07
Iteration 122: tolerance = 1.189e-07
Iteration 123: tolerance = 1.074e-07
Iteration 124: tolerance = 9.697e-08

```

Cross-sectional time-series FGLS regression

Coefficients: **generalized least squares**

Panels: **heteroskedastic**

Correlation: **no autocorrelation**

Estimated covariances	=	255	Number of obs	=	1,275
Estimated autocorrelations	=	0	Number of groups	=	255
Estimated coefficients	=	8	Time periods	=	5
			Wald chi2(7)	=	3850.64
Log likelihood	=	519.361	Prob > chi2	=	0.0000

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]

x1	.0834067	.0045748	18.23	0.000	.0744403	.0923732
x2	.0163976	.0032919	4.98	0.000	.0099456	.0228497
x3	-.3631261	.0505673	-7.18	0.000	-.4622362	-.264016
x4	.3191455	.1093883	2.92	0.004	.1047484	.5335426
x5	-.1093301	.0043601	-25.07	0.000	-.1178758	-.1007844
x6	.1361732	.0275038	4.95	0.000	.0822667	.1900797
x7	-.2282655	.0063087	-36.18	0.000	-.2406303	-.2159007
_cons	-.037658	.0426502	-0.88	0.377	-.1212509	.0459349

```
7 . estat imtest, white
subcommand estat imtest is unrecognized
r(321);
```

```
8 . estat imtest , white
subcommand estat imtest is unrecognized
r(321);
```

```
9 . reg y x1 x2 x3 x4 x5 x6 x7
```

Source	SS	df	MS	Number of obs	=	1,275
Model	37.9375371	7	5.41964815	F(7, 1267)	=	127.76
Residual	53.7478325	1,267	.042421336	Prob > F	=	0.0000
				R-squared	=	0.4138
				Adj R-squared	=	0.4105
Total	91.6853695	1,274	.071966538	Root MSE	=	.20596

y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
x1	.0794732	.0094177	8.44	0.000	.0609972	.0979492
x2	.0183375	.0051583	3.55	0.000	.0082177	.0284572
x3	.0977707	.0527988	1.85	0.064	-.005812	.2013535
x4	.0873838	.2192954	0.40	0.690	-.3428383	.517606
x5	-.1076457	.0069432	-15.50	0.000	-.1212671	-.0940243
x6	-.1432493	.01874	-7.64	0.000	-.1800142	-.1064845
x7	-.2712849	.0120328	-22.55	0.000	-.2948913	-.2476786
_cons	-.0107965	.0863053	-0.13	0.900	-.1801134	.1585205

```
10 . estat imtest, white
```

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity

```
chi2(34)      =    176.18
Prob > chi2   =    0.0000
```

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
--------	------	----	---

Heteroskedasticity	176.18	34	0.0000
Skewness	61.74	7	0.0000
Kurtosis	17.26	1	0.0000
Total	255.18	42	0.0000

11 . *p-value < 0.5, there is heteroskedasticity problem

12 . *B

13 . xtglsl y x1 x2 x3 x4 x5 x6 x7

Cross-sectional time-series FGLS regression

Coefficients: **generalized least squares**

Panels: **homoskedastic**

Correlation: **no autocorrelation**

Estimated covariances	=	1	Number of obs	=	1,275
Estimated autocorrelations	=	0	Number of groups	=	255
Estimated coefficients	=	8	Time periods	=	5
			Wald chi2(7)	=	899.95
Log likelihood	=	209.4322	Prob > chi2	=	0.0000

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
x1	.0794732	.0093881	8.47	0.000	.0610728	.0978735
x2	.0183375	.0051421	3.57	0.000	.0082592	.0284158
x3	.0977707	.0526329	1.86	0.063	-.0053879	.2009293
x4	.0873838	.2186064	0.40	0.689	-.3410767	.5158444
x5	-.1076457	.0069214	-15.55	0.000	-.1212114	-.0940801
x6	-.1432493	.0186811	-7.67	0.000	-.1798637	-.106635
x7	-.2712849	.011995	-22.62	0.000	-.2947946	-.2477753
_cons	-.0107965	.0860341	-0.13	0.900	-.1794201	.1578272

14 . ~~xtreg y x1 x2 x3 x4 x5 x6 x7, fe~~

~~Fixed-effects (within) regression~~

~~Group variable: **crossid**~~

~~R-sq:~~

~~within = 0.3772~~

~~between = 0.1103~~

~~overall = 0.1644~~

~~Number of obs = 1,275~~

~~Number of groups = 255~~

~~Obs per group:~~

~~min = 5~~

~~avg = 5.0~~

~~max = 5~~

~~corr(u_i, Xb) = -0.2003~~

~~F(7,1013) = 87.64~~

~~Prob > F = 0.0000~~

y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
x1	-.1256447	.0180942	-6.94	0.000	-.161151	-.0901384
x2	.0123739	.008023	1.54	0.123	-.0033697	.0281176
x3	.0747825	.039773	1.88	0.060	-.0032643	.1528293
x4	.6493144	.2855092	2.27	0.023	.0890573	1.209572
x5	-.1104883	.0061097	-18.08	0.000	-.1224773	-.0984992
x6	-.1461423	.0141035	-10.36	0.000	-.1738178	-.1184669
x7	-.0951497	.0121853	-7.81	0.000	-.1190611	-.0712383
_cons	1.756067	.1658407	10.59	0.000	1.430636	2.081497
sigma_u	.22675694					
sigma_e	.11725953					
rho	.78902632	(fraction of variance due to u_i)				

F test that all u_i=0: F(254, 1013) = 11.40 Prob > F = 0.0000

15 . xtreg y x1 x2 x3 x4 x5 x6 x7, re

Random-effects GLS regression
Group variable: **crossid**

Number of obs = 1,275
Number of groups = 255

R-sq:

within = 0.3492
between = 0.3404
overall = 0.3377

Obs per group:

min = 5
avg = 5.0
max = 5

corr(u_i, X) = 0 (assumed)

Wald chi2(7) = 663.43
Prob > chi2 = 0.0000

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
x1	-.0145018	.0133366	-1.09	0.277	-.040641	.0116375
x2	.0146948	.0064463	2.28	0.023	.0020604	.0273292
x3	.0985565	.0399464	2.47	0.014	.020263	.1768501
x4	.4693539	.2493856	1.88	0.060	-.0194329	.9581407
x5	-.1117985	.005959	-18.76	0.000	-.1234779	-.100119
x6	-.1541318	.014125	-10.91	0.000	-.1818163	-.1264472
x7	-.1494529	.0115006	-13.00	0.000	-.1719937	-.1269122
_cons	.7714573	.1226841	6.29	0.000	.5310009	1.011914
sigma_u	.15944933					
sigma_e	.11725953					
rho	.64900604	(fraction of variance due to u_i)				

16 . xtreg y x1 x2 x3 x4 x5 x6 x7, fe

Fixed-effects (within) regression
Group variable: **crossid**

Number of obs = 1,275
Number of groups = 255

R-sq:		Obs per group:	
within	= 0.3772	min	= 5
between	= 0.1103	avg	= 5.0
overall	= 0.1644	max	= 5
		F(7,1013)	= 87.64
corr(u_i, Xb)	= -0.2003	Prob > F	= 0.0000

y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
x1	-.1256447	.0180942	-6.94	0.000	-.161151	-.0901384
x2	.0123739	.008023	1.54	0.123	-.0033697	.0281176
x3	.0747825	.039773	1.88	0.060	-.0032643	.1528293
x4	.6493144	.2855092	2.27	0.023	.0890573	1.209572
x5	-.1104883	.0061097	-18.08	0.000	-.1224773	-.0984992
x6	-.1461423	.0141035	-10.36	0.000	-.1738178	-.1184669
x7	-.0951497	.0121853	-7.81	0.000	-.1190611	-.0712383
_cons	1.756067	.1658407	10.59	0.000	1.430636	2.081497
sigma_u	.22676694					
sigma_e	.11725953					
rho	.78902632	(fraction of variance due to u_i)				

F test that all u_i=0: F(254, 1013) = 11.40 Prob > F = 0.0000

```
17 . estimates store fixed
18 . predict y_fe, xbu
19 . xtreg y x1 x2 x3 x4 x5 x6 x7, re
```

Random-effects GLS regression	Number of obs	=	1,275
Group variable: crossid	Number of groups	=	255

R-sq:		Obs per group:	
within	= 0.3492	min	= 5
between	= 0.3404	avg	= 5.0
overall	= 0.3377	max	= 5
		Wald chi2(7)	= 663.43
corr(u_i, X)	= 0 (assumed)	Prob > chi2	= 0.0000

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
x1	-.0145018	.0133366	-1.09	0.277	-.040641	.0116375
x2	.0146948	.0064463	2.28	0.023	.0020604	.0273292
x3	.0985565	.0399464	2.47	0.014	.020263	.1768501
x4	.4693539	.2493856	1.88	0.060	-.0194329	.9581407
x5	-.1117985	.005959	-18.76	0.000	-.1234779	-.100119

x0	-.1541518	.014125	-10.91	0.000	-.1616105	-.1204472
x7	-.1494529	.0115006	-13.00	0.000	-.1719937	-.1269122
_cons	.7714573	.1226841	6.29	0.000	.5310009	1.011914
sigma_u	.15944933					
sigma_e	.11725953					
rho	.64900604	(fraction of variance due to u_i)				

20 . estimates store random

21 . predict y_re, xbu

22 . hausman random fixed

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) random	(B) fixed		
x1	-.0145018	-.1256447	.1111429	.
x2	.0146948	.0123739	.0023208	.
x3	.0985565	.0747825	.0237741	.0037189
x4	.4693539	.6493144	-.1799605	.
x5	-.1117985	-.1104883	-.0013102	.
x6	-.1541318	-.1461423	-.0079894	.0007791
x7	-.1494529	-.0951497	-.0543033	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = -190.39 chi2<0 ==> model fitted on these
 data fails to meet the asymptotic
 assumptions of the Hausman test;
 see suest for a generalized test

23 . *According to FE results, p-value is < 0.05 so the fixed effect exists here. So we
 > reject Ho so FE is more appropriated.

24 . *The bigger firm the less leverage which makes sense since they can raise funds fr
 > he higher return on asset higher leverage, The more tax shield the higher leverage
 > row more, High growth firm low leverage, Highe risk firm lower leverage, The highe

25 . log close
 name: <unnamed>
 log: /Users/mien/Desktop/ee426/assignment7_426.smcl
 log type: smcl
 closed on: 17 Mar 2021, 23:10:03

. *According to FE results, p-value is < 0.05 so the fixed effect exists here. So we cant use the Panel Least Squares. Now looking at hausman test, we
> reject H_0 so FE is more appropriated.

. *The bigger firm the less leverage which makes sense since they can raise funds from common shares too, The more tangible assets the more leverage, T
> he higher return on asset higher leverage, The more tax shield the higher leverage because interest payment is tax deductable so they would wanna bor
> row more, High growth firm low leverage, Highe risk firm lower leverage, The higher dividend payment the lower leverage