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name: <unnamed>
log: S:\Kingsley Osunkwo Files\Linear regression_And_Multilevel_models-\
> Log to be submitted 2.smcl
log type: smcl
opened on: 27 Nov 2024, 14:55:07
```

```
. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"
```

```
. reg log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus
```

```
Source |      SS      df    MS  Number of obs =   2,892
-----+----- F(3, 2888)   =   51.64
Model | 13.6342867      3 4.54476224 Prob > F      =   0.0000
Residual | 254.159841   2,888 .088005485 R-squared    =   0.0509
-----+----- Adj R-squared =   0.0499
Total | 267.794128   2,891 .092630276 Root MSE    =   .29666
```

```
-----
log_EntTotal |   Coef.   Std. Err.    t   P>|t|   [95% Conf. Interval]
-----+-----
lag_EduLog | .1254778 .0150513    8.34 0.000   .0959654   .1549903
lag_ForeignLog | -.1317712 .0119819  -11.00 0.000  -.1552652  -.1082772
log_lag_Bus | .0126364 .0166479    0.76 0.448  -.0200066   .0452795
   _cons | 4.767443 .0808005   59.00 0.000   4.60901   4.925876
-----
```

```
.
end of do-file
```

```
. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"
```

```
. reg log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus if year==2008
```

```
Source |      SS      df    MS  Number of obs =    289
-----+----- F(3, 285)   =   13.82
Model | 2.78361243      3 .927870809 Prob > F      =   0.0000
Residual | 19.1417118   285 .067163901 R-squared    =   0.1270
-----+----- Adj R-squared =   0.1178
Total | 21.9253242   288 .076129598 Root MSE    =   .25916
```

```
-----
log_EntTotal |   Coef.   Std. Err.    t   P>|t|   [95% Conf. Interval]
-----+-----
```

```

lag_EduLog | -.0089048 .0427575 -0.21 0.835 -.0930654 .0752558
lag_ForeignLog | -.1922935 .0338956 -5.67 0.000 -.259011 -.1255759
log_lag_Bus | -.0964246 .0533964 -1.81 0.072 -.2015259 .0086767
_cons | 4.820718 .2508854 19.21 0.000 4.326895 5.314542
-----

```

```

.
end of do-file

```

```

. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"

```

```

. reg log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus, vce(cluster municip_co
> de)

```

```

Linear regression               Number of obs   =    2,892
                               F(3, 289)       =     6.91
                               Prob > F        =    0.0002
                               R-squared        =    0.0509
                               Root MSE     =    .29666

```

(Std. Err. adjusted for 290 clusters in municip_code)

```

-----
|               Robust
log_EntTotal |   Coef.   Std. Err.      t    P>|t|   [95% Conf. Interval]
-----+-----
lag_EduLog | .1254778   .0385611     3.25  0.001   .0495815   .2013741
lag_ForeignLog | -.1317712   .0310708    -4.24  0.000   -.192925   -.0706173
log_lag_Bus | .0126364   .0392725     0.32  0.748   -.06466   .0899329
_cons | 4.767443   .1935112    24.64  0.000   4.386573   5.148313
-----

```

```

.
end of do-file

```

```

. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"

```

```

. mixed log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus || municip_code:

```

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = 952.20754

Iteration 1: log likelihood = 952.20754

Computing standard errors:

Mixed-effects ML regression Number of obs = 2,892
Group variable: municip_code Number of groups = 290

Obs per group:
min = 3
avg = 10.0
max = 10

Wald chi2(3) = 2435.13
Log likelihood = 952.20754 Prob > chi2 = 0.0000

```
-----+-----
log_EntTotal |   Coef.   Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
lag_EduLog | .9538102 .0353885  26.95  0.000   .8844501   1.02317
lag_ForeignLog | .0813408 .0302578   2.69  0.007   .0220365   .140645
log_lag_Bus | .0841887 .0136232   6.18  0.000   .0574877   .1108897
_cons | 6.837121 .0898842  76.07  0.000   6.660951   7.01329
-----+-----
```

```
-----+-----
Random-effects Parameters |   Estimate   Std. Err.   [95% Conf. Interval]
-----+-----
municip_code: Identity |
var(_cons) | .2104221 .0190726   .1761726   .2513299
-----+-----
var(Residual) | .0188831 .0005284   .0178753   .0199478
-----+-----
LR test vs. linear model: chibar2(01) = 3078.96      Prob >= chibar2 = 0.0000
```

.
end of do-file

. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"

. reg log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus

```
-----+-----
Source |   SS       df   MS       Number of obs =   2,892
-----+-----
Model | 13.6342867    3  4.54476224   F(3, 2888) =   51.64
Residual | 254.159841  2,888 .088005485   Prob > F      =   0.0000
-----+-----
R-squared      =   0.0509
```

-----+----- Adj R-squared = 0.0499
Total | 267.794128 2,891 .092630276 Root MSE = .29666

log_EntTotal	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lag_EduLog	.1254778	.0150513	8.34	0.000	.0959654	.1549903
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log_lag_Bus	.0126364	.0166479	0.76	0.448	-.0200066	.0452795
_cons	4.767443	.0808005	59.00	0.000	4.60901	4.925876

```
. predict Pooled1, r
(12 missing values generated)
```

```
. kdensity Pooled1,normal
```

. estat vif

Variable	VIF	1/VIF
lag_EduLog	1.15	0.872417
lag_Foreig~g	1.10	0.910186
log_lag_Bus	1.08	0.926694
Mean VIF	1.11	

```

. type Clustered1, normal
option normal not allowed
r(198);

```

end of do-file

```
r(198);
```

```
. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"
```

```
. reg log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus, vce(cluster munic_co
> de)
```

Linear regression	Number of obs	=	2,892
	F(3, 289)	=	6.91
	Prob > F	=	0.0002
	R-squared	=	0.0509

Root MSE = .29666

(Std. Err. adjusted for 290 clusters in municip_code)

-----+-----						
	Robust					
log_EntTotal	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
lag_EduLog	.1254778	.0385611	3.25	0.001	.0495815	.2013741
lag_ForeignLog	-.1317712	.0310708	-4.24	0.000	-.192925	-.0706173
log_lag_Bus	.0126364	.0392725	0.32	0.748	-.06466	.0899329
_cons	4.767443	.1935112	24.64	0.000	4.386573	5.148313
-----+-----						

. predict Clustered1, r
(12 missing values generated)

. kdensity Clustered1, normal

. estat vif

Variable	VIF	1/VIF
-----+-----		
lag_EduLog	1.15	0.872417
lag_ForeignLog	1.10	0.910186
log_lag_Bus	1.08	0.926694
-----+-----		
Mean VIF	1.11	

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end of do-file

. do "C:\Users\kios0005\AppData\Local\Temp\STD00000000.tmp"

. mixed log_EntTotal lag_EduLog lag_ForeignLog log_lag_Bus || municip_code:

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = 952.20754

Iteration 1: log likelihood = 952.20754

Computing standard errors:

Mixed-effects ML regression
Group variable: municip_code

Number of obs = 2,892
Number of groups = 290

Obs per group:

min = 3
avg = 10.0
max = 10

Wald chi2(3) = 2435.13

Log likelihood = 952.20754

Prob > chi2 = 0.0000

```
-----+-----
log_EntTotal |   Coef.   Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
lag_EduLog | .9538102 .0353885  26.95  0.000   .8844501   1.02317
lag_ForeignLog | .0813408 .0302578   2.69  0.007   .0220365   .140645
log_lag_Bus | .0841887 .0136232   6.18  0.000   .0574877   .1108897
   _cons | 6.837121 .0898842  76.07  0.000   6.660951   7.01329
-----+-----
```

```
-----+-----
Random-effects Parameters |   Estimate   Std. Err.   [95% Conf. Interval]
-----+-----
municip_code: Identity    |
var(_cons) | .2104221 .0190726   .1761726   .2513299
-----+-----
var(Residual) | .0188831 .0005284   .0178753   .0199478
-----+-----
```

LR test vs. linear model: chibar2(01) = 3078.96 Prob >= chibar2 = 0.0000

. predict Mixed1, r
(12 missing values generated)

. kdensity Mixed1, normal

.
end of do-file

. do "C:\Users\kios0005\AppData\Local\Temp\STD000000000.tmp"

. estat icc

Residual intraclass correlation

Level	ICC	Std. Err.	[95% Conf. Interval]	
+				
municip_code	.9176506	.0072781	.9022146	.9308368

.
end of do-file

. log close
name: <unnamed>
log: S:\Kingsley Osunkwo Files\Linear regression_And_Multilevel_models-\
> Log to be submitted 2.smcl
log type: smcl
closed on: 27 Nov 2024, 14:56:20