Summarize age logmort etc





Orignial and FE smoking vs log mort

xi: regress logmortrate smokerate i.agecat

i.agecat \_Iagecat\_1-5 (naturally coded; \_Iagecat\_1 omitted)

Source | SS df MS Number of obs = 20

-------------+------------------------------ F( 5, 14) = 20.28

Model | 18.6784752 5 3.73569505 Prob > F = 0.0000

Residual | 2.57825801 14 .184161287 R-squared = 0.8787

-------------+------------------------------ Adj R-squared = 0.8354

Total | 21.2567333 19 1.11877543 Root MSE = .42914

------------------------------------------------------------------------------

logmortrate | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-------------+----------------------------------------------------------------

smokerate | 9.470745 13.58926 0.70 0.497 -19.67533 38.61682

\_Iagecat\_2 | -.5856712 .4373835 -1.34 0.202 -1.523765 .3524232

\_Iagecat\_3 | -1.604822 .3403408 -4.72 0.000 -2.334781 -.8748638

\_Iagecat\_4 | -2.016714 .3307931 -6.10 0.000 -2.726195 -1.307233

\_Iagecat\_5 | -2.525677 .4181735 -6.04 0.000 -3.42257 -1.628784

\_cons | -3.592617 1.061734 -3.38 0.004 -5.869811 -1.315423

xtreg logmortrate smokerate, fe

Fixed-effects (within) regression Number of obs = 20

Group variable: agecat Number of groups = 5

R-sq: within = 0.0335 Obs per group: min = 4

between = 0.2461 avg = 4.0

overall = 0.1575 max = 4

F(1,14) = 0.49

corr(u\_i, Xb) = 0.3292 Prob > F = 0.4973

------------------------------------------------------------------------------

logmortrate | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-------------+----------------------------------------------------------------

smokerate | 9.470745 13.58926 0.70 0.497 -19.67533 38.61682

\_cons | -4.939194 .8674434 -5.69 0.000 -6.799675 -3.078713

-------------+----------------------------------------------------------------

sigma\_u | 1.036617

sigma\_e | .42914017

rho | .85369349 (fraction of variance due to u\_i)

------------------------------------------------------------------------------

F test that all u\_i=0: F(4, 14) = 20.81 Prob > F = 0.0000

Random effects model

xtreg logmortrate smokerate, re

Random-effects GLS regression Number of obs = 20

Group variable: agecat Number of groups = 5

R-sq: within = 0.0335 Obs per group: min = 4

between = 0.2461 avg = 4.0

overall = 0.1575 max = 4

Wald chi2(1) = 0.84

corr(u\_i, X) = 0 (assumed) Prob > chi2 = 0.3603

------------------------------------------------------------------------------

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

-------------+----------------------------------------------------------------

smokerate | 11.97934 13.0938 0.91 0.360 -13.68403 37.64272

\_cons | -5.098342 .9586468 -5.32 0.000 -6.977256 -3.219429

-------------+----------------------------------------------------------------

sigma\_u | 1.0591733

sigma\_e | .42914017

rho | .8589893 (fraction of variance due to u\_i)

------------------------------------------------------------------------------

Regression of age vs log mortality

regress age logmort

Source | SS df MS Number of obs = 36

-------------+------------------------------ F( 1, 34) = 326.54

Model | 3518.63784 1 3518.63784 Prob > F = 0.0000

Residual | 366.36216 34 10.7753577 R-squared = 0.9057

-------------+------------------------------ Adj R-squared = 0.9029

Total | 3885 35 111 Root MSE = 3.2826

------------------------------------------------------------------------------

age | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-------------+----------------------------------------------------------------

logmort | 10.87657 .6018949 18.07 0.000 9.653376 12.09977

\_cons | 94.97812 1.564069 60.73 0.000 91.79955 98.15669

------------------------------------------------------------------------------

Plotting the graph



Plot of residuals



Seems to be slightly tighter at higher values

Run a Breusch-Pagan test

Null hyp is residuals are homoscedastic

estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of age

chi2(1) = 2.67

Prob > chi2 = 0.1022

At 95% fail to reject the null H0 so homo

We can test for omitted variables using ovtest

Reg logmort age

ovtest

includes y2 y3 y4

Specification test: Do we need more variables in the model?

Linktest \_hatsq fail to reject so no more variables needed

Check for multicollinearity

Vif



OLS assumes normal residuals

predict e, resid

kdensity e, normal



Pnorm e



Qnorm e



Shapiro-Wilk test

swilk e

Shapiro-Wilk W test for normal data

Variable | Obs W V z Prob>z

-------------+--------------------------------------------------

e | 36 0.96047 1.442 0.765 0.22220

use outreg2 for output commands