**Lab session II Wednesday – Chp. 8 - Heteroskedasticity**

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 name: <unnamed>

 log: J:\Multilevel TA\chp8\_heterosk.log

 log type: text

 opened on: 16 Apr 2012, 23:38:41

. \* Example 8.1 Residual variance depending on gender

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. clear

. infile schoolnr pupilNR\_new langpost ses IQ\_verb sex Minority denomina sch\_ses sch\_iqv sch\_min usin

> g "mlbook2\_r.txt" in 2/3759, clear

(eof not at end of obs)

(3758 observations read)

.

.

. egen gmeanIQverb = mean(IQ\_verb), by(schoolnr)

. egen gmeanSES = mean(ses), by(schoolnr)

. gen IQXSES = IQ\_verb\*ses

. gen IQMeanXsesMean=gmeanSES \* gmeanIQverb

. gen girl = sex

. gen boy =1-girl

.

. \*We need to create a pseudo-level

.

. xtmixed langpost IQ\_verb ses IQXSES girl gmeanIQverb gmeanSES IQMeanXsesMean || schoolnr : IQ\_

> verb , covariance(un) var || pupilNR\_new : boy , nocons

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -12281.976

Iteration 1: log likelihood = -12242.267

Iteration 2: log likelihood = -12242.082

Iteration 3: log likelihood = -12241.992

Iteration 4: log likelihood = -12241.992

Computing standard errors:

Mixed-effects ML regression Number of obs = 3758

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 | No. of Observations per Group

 Group Variable | Groups Minimum Average Maximum

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 schoolnr | 211 4 17.8 34

 pupilNR\_new | 3758 1 1.0 1

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 Wald chi2(7) = 2259.27

Log likelihood = -12241.992 Prob > chi2 = 0.0000

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

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 IQ\_verb | 2.246359 .0616588 36.43 0.000 2.12551 2.367208

 ses | .1705374 .0114256 14.93 0.000 .1481436 .1929312

 IQXSES | -.0196077 .0047878 -4.10 0.000 -.0289916 -.0102238

 girl | 2.406129 .2011947 11.96 0.000 2.011795 2.800464

 gmeanIQverb | .6956993 .2972366 2.34 0.019 .1131262 1.278272

 gmeanSES | -.086112 .0423128 -2.04 0.042 -.1690435 -.0031805

IQMeanXsesMean | -.1039809 .0333906 -3.11 0.002 -.1694252 -.0385365

 \_cons | 40.41372 .2688958 150.30 0.000 39.88669 40.94074

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 Random-effects Parameters | Estimate Std. Err. [95% Conf. Interval]

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schoolnr: Unstructured |

 var(IQ\_verb) | .1471334 .0656819 .0613375 .3529367

 var(\_cons) | 8.333196 1.044446 6.518171 10.65363

 cov(IQ\_verb,\_cons) | -.9119776 .2088086 -1.321235 -.5027203

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pupilNR\_new: Identity |

 var(boy) | 3.774126 1.760282 1.512897 9.415067

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 var(Residual) | 34.08033 1.187296 31.83094 36.48867

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LR test vs. linear regression: chi2(4) = 446.30 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

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. \*Observe that the model requires that var(boy)-var(girl)>0. Also observe that the result will be 2\*

> (var(boy)-var(girl)) as we are calculating the difference in variance rather than the variance itse

> lf

. \*See equation 8.1 on page 120 in the book.

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. capture log close