Statistics/Data Analysis

```
      name:  <unnamed>
       log:  /hdir/0/jhaber/Projects/charter_data/sorting-schools-2019/logs/results_1_
> ibl_mi100_linear_101019.smcl
  log type:  smcl
 opened on:  18 Oct 2019, 14:43:05

1 . ** ------------------------------------------------------
2 . ** MIXED-EFFECTS LINEAR MODELS PT 1: RACE & POVERTY -> IBL
3 . ** ------------------------------------------------------
4 .
5 . * Sequence of models:
6 . * 0. controls only
7 . * 1. school poverty
8 . * 2. school race
9 . * 3. school district poverty
10. * 4. school district race
11.
12.
13. * 0. controls only
14. mi xeq 1 / 5: mixed inquiry_full_log primary middle high lnage lnstudents urban pctp
  > dfs || cmoname: ,

  m=1 data:
  -> mixed inquiry_full_log primary middle high lnage lnstudents urban pctpdfs || cmonam
  > e: ,

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  4455.9868
  Iteration 1:   log likelihood =  4455.9868

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      5,784
  Group variable: cmoname                         Number of groups  =        377

                                                  Obs per group:
                                                                min =          1
                                                                avg =       15.3
                                                                max =      3,737

                                                  Wald chi2(7)      =      78.06
  Log likelihood =  4455.9868                     Prob > chi2       =     0.0000
```

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	.0008557	.0039439	0.22	0.828	-.0068742	.0085856
middle	-.0177352	.0058951	-3.01	0.003	-.0292895	-.0061809
high	-.0133816	.0047246	-2.83	0.005	-.0226416	-.0041216
lnage	-.0039581	.0016284	-2.43	0.015	-.0071498	-.0007664
lnstudents	.0091555	.0016993	5.39	0.000	.0058248	.0124861
urban	.0005409	.0030919	0.17	0.861	-.0055192	.006601
pctpdfs	.1153734	.0318874	3.62	0.000	.0528753	.1778715
_cons	.0660635	.0116146	5.69	0.000	.0432992	.0888277

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0058353	.0006587	.0046771	.0072804
var(Residual)	.0116775	.0002238	.011247	.0121244

LR test vs. linear model: chibar2(01) = **666.32** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed inquiry_full_log primary middle high lnage lnstudents urban pctpdfs || cmonam**
> e: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4455.9868**
Iteration 1: log likelihood = **4455.9868**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**7**) = **78.06**
Log likelihood = **4455.9868** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	**.0008557**	**.0039439**	**0.22**	**0.828**	**-.0068742**	**.0085856**
middle	**-.0177352**	**.0058951**	**-3.01**	**0.003**	**-.0292895**	**-.0061809**
high	**-.0133816**	**.0047246**	**-2.83**	**0.005**	**-.0226416**	**-.0041216**
lnage	**-.0039581**	**.0016284**	**-2.43**	**0.015**	**-.0071498**	**-.0007664**
lnstudents	**.0091555**	**.0016993**	**5.39**	**0.000**	**.0058248**	**.0124861**
urban	**.0005409**	**.0030919**	**0.17**	**0.861**	**-.0055192**	**.006601**
pctpdfs	**.1153734**	**.0318874**	**3.62**	**0.000**	**.0528753**	**.1778715**
_cons	**.0660635**	**.0116146**	**5.69**	**0.000**	**.0432992**	**.0888277**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0058353**	**.0006587**	**.0046771**	**.0072804**
var(Residual)	**.0116775**	**.0002238**	**.011247**	**.0121244**

LR test vs. linear model: chibar2(01) = **666.32** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed inquiry_full_log primary middle high lnage lnstudents urban pctpdfs || cmonam**
> e: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4455.9868**
Iteration 1: log likelihood = **4455.9868**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**7**) = **78.06**
Log likelihood = **4455.9868** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	.0008557	.0039439	0.22	0.828	-.0068742	.0085856
middle	-.0177352	.0058951	-3.01	0.003	-.0292895	-.0061809
high	-.0133816	.0047246	-2.83	0.005	-.0226416	-.0041216
lnage	-.0039581	.0016284	-2.43	0.015	-.0071498	-.0007664
lnstudents	.0091555	.0016993	5.39	0.000	.0058248	.0124861
urban	.0005409	.0030919	0.17	0.861	-.0055192	.006601
pctpdfs	.1153734	.0318874	3.62	0.000	.0528753	.1778715
_cons	.0660635	.0116146	5.69	0.000	.0432992	.0888277

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	.0058353	.0006587	.0046771	.0072804
var(Residual)	.0116775	.0002238	.011247	.0121244

LR test vs. linear model: chibar2(01) = **666.32** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed inquiry_full_log primary middle high lnage lnstudents urban pctpdfs || cmonam**
> e: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4455.9868**
Iteration 1: log likelihood = **4455.9868**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**7**) = **78.06**
Log likelihood = **4455.9868** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	.0008557	.0039439	0.22	0.828	-.0068742	.0085856
middle	-.0177352	.0058951	-3.01	0.003	-.0292895	-.0061809
high	-.0133816	.0047246	-2.83	0.005	-.0226416	-.0041216
lnage	-.0039581	.0016284	-2.43	0.015	-.0071498	-.0007664
lnstudents	.0091555	.0016993	5.39	0.000	.0058248	.0124861
urban	.0005409	.0030919	0.17	0.861	-.0055192	.006601
pctpdfs	.1153734	.0318874	3.62	0.000	.0528753	.1778715
_cons	.0660635	.0116146	5.69	0.000	.0432992	.0888277

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	.0058353	.0006587	.0046771	.0072804
var(Residual)	.0116775	.0002238	.011247	.0121244

LR test vs. linear model: chibar2(01) = **666.32** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed inquiry_full_log primary middle high lnage lnstudents urban pctpdfs || cmonam**
> e: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4455.9868**
Iteration 1: log likelihood = **4455.9868**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**7**) = **78.06**
Log likelihood = **4455.9868** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	**.0008557**	**.0039439**	**0.22**	**0.828**	**-.0068742**	**.0085856**
middle	**-.0177352**	**.0058951**	**-3.01**	**0.003**	**-.0292895**	**-.0061809**
high	**-.0133816**	**.0047246**	**-2.83**	**0.005**	**-.0226416**	**-.0041216**
lnage	**-.0039581**	**.0016284**	**-2.43**	**0.015**	**-.0071498**	**-.0007664**
lnstudents	**.0091555**	**.0016993**	**5.39**	**0.000**	**.0058248**	**.0124861**
urban	**.0005409**	**.0030919**	**0.17**	**0.861**	**-.0055192**	**.006601**
pctpdfs	**.1153734**	**.0318874**	**3.62**	**0.000**	**.0528753**	**.1778715**
_cons	**.0660635**	**.0116146**	**5.69**	**0.000**	**.0432992**	**.0888277**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0058353**	**.0006587**	**.0046771**	**.0072804**
var(Residual)	**.0116775**	**.0002238**	**.011247**	**.0121244**

LR test vs. linear model: chibar2(01) = **666.32** Prob >= chibar2 = **0.0000**

15. mi est, dots post: mixed inquiry_full_log primary middle high lnage lnstudents urban
> pctpdfs || cmoname: ,

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....
> ..80.....90.....100 done

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **5,784**

Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Average RVI = **0.0000**
Largest FMI = **0.0000**
DF adjustment: **Large sample** — DF: min = **5.23e+63**
avg = **5.23e+63**
max = **.**
Model F test: **Equal FMI** — F(**7**, **6.6e+65**) = **11.15**
Prob > F = **0.0000**

inquiry_full_log	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
primary	.0008557	.0039439	0.22	0.828	-.0068742	.0085856
middle	-.0177352	.0058951	-3.01	0.003	-.0292895	-.0061809
high	-.0133816	.0047246	-2.83	0.005	-.0226416	-.0041216
lnage	-.0039581	.0016284	-2.43	0.015	-.0071498	-.0007664
lnstudents	.0091555	.0016993	5.39	0.000	.0058248	.0124861
urban	.0005409	.0030919	0.17	0.861	-.0055192	.006601
pctpdfs	.1153734	.0318874	3.62	0.000	.0528753	.1778715
_cons	.0660635	.0116146	5.69	0.000	.0432992	.0888277

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
sd(_cons)	.0763891	.0043117	.068389	.0853251
sd(Residual)	.1080624	.0010354	.106052	.1101109

16. est store ibl0

17. ereturn list

scalars:

```
              e(small) =  0
          e(nrgroups) =  1
              e(ll_c) =  .
              e(k_rs) =  2
                 e(N) =  5784
              e(df_c) =  .
              e(k_rc) =  0
                e(rc) =  0
                 e(k) =  10
             e(k_res) =  0
         e(converged) =  1
         e(se_failed) =  0
               e(k_r) =  2
                e(ll) =  .
             e(mecmd) =  0
            e(chi2_c) =  .
                e(ic) =  1
          e(nostderr) =  0
              e(df_m) =  .
                 e(p) =  .
               e(p_c) =  .
               e(k_f) =  8
              e(rank) =  .
              e(chi2) =  .
        e(_dfnote_mi) =  1
        e(mcerror_mi) =  0
          e(N_min_mi) =  5784
          e(N_max_mi) =  5784
        e(cilevel_mi) =  95
          e(k_exp_mi) =  0
      e(reparm_rc_mi) =  .
     e(k_eq_model_mi) =  3
         e(caller_mi) =  15.1
         e(df_min_mi) =  5.23358309346e+63
         e(df_avg_mi) =  5.23358309346e+63
         e(df_max_mi) =  .
        e(fmi_max_mi) =  1.37536521239e-31
        e(rvi_avg_mi) =  2.31165553365e-32
              e(p_mi) =  3.41889596130e-14
           e(ufmi_mi) =  0
       e(rvi_avg_F_mi) =  3.22290053807e-32
              e(F_mi) =  11.15177961308376
           e(df_m_mi) =  7
           e(df_r_mi) =  6.59500366934e+65
           e(df_c_mi) =  .
```

```
              e(N_mi) =  5784
              e(M_mi) =  100
       e(esampvary_mi) =  0

macros:
               e(cmd) : "mixed"
         e(rstructure) : "independent"
         e(rstructlab) : "Independent"
              e(iccok) : "ok"
              e(redim) : "1"
          e(optmetric) : "matsqrt"
  e(datasignaturevars) : "inquiry_full_log primary middle high lnage lnstudents urban
> pc.."
           e(vartypes) : "Identity"
              e(title) : "Mixed-effects ML regression"
          e(stripe_se) : "inquiry_full_log:primary inquiry_full_log:middle inquiry_ful
> l_.."
           e(chi2type) : "Wald"
          e(ml_method) : "d0"
             e(depvar) : "inquiry_full_log"
                e(opt) : "moptimize"
           e(crittype) : "log likelihood"
             e(revars) : "_cons"
              e(ivars) : "cmoname"
             e(method) : "ML"
          e(technique) : "nr"
            e(cmdline) : "mixed inquiry_full_log primary middle high lnage lnstudents
> ur.."
      e(datasignature) : "5784:9:3410722874:4089627785"
               e(m_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
            e(m_est_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
              e(rc_mi) : "0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> 0 .."
        e(dfadjust_mi) : "Large sample"
       e(modeltest_mi) : "Equal FMI"
           e(title_mi) : "Multiple-imputation estimates"
          e(prefix_mi) : "mi estimate"
             e(cmd_mi) : "mixed"
            e(ecmd_mi) : "mixed"
                 e(mi) : "mi"
         e(cmdline_mi) : "mi estimate , dots post: mixed inquiry_full_log primary midd
> le.."
       e(_sortseed_mi) : "931894713XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
    e(_sortseedcmd_mi) : "1392474105XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa1
> 20.."
         e(properties) : "b V"

matrices:
                  e(b) :  1 x 10
                  e(V) :  10 x 10
               e(b_sd) :  1 x 10
             e(noomit) :  1 x 8
           e(b_pclass) :  1 x 10
              e(g_min) :  1 x 1
              e(se_sd) :  1 x 10
              e(g_max) :  1 x 1
              e(g_avg) :  1 x 1
                e(N_g) :  1 x 1
               e(V_sd) :  10 x 10
              e(re_mi) :  1 x 10
             e(fmi_mi) :  1 x 10
            e(pise_mi) :  1 x 10
             e(rvi_mi) :  1 x 10
              e(df_mi) :  1 x 10
               e(W_mi) :  10 x 10
               e(B_mi) :  10 x 10
               e(V_mi) :  10 x 10
               e(b_mi) :  1 x 10
             e(N_g_mi) :  1 x 1
```

```
            e(g_min_mi) :  1 x 1
            e(g_avg_mi) :  1 x 1
            e(g_max_mi) :  1 x 1

18. est save "model_estimates/1a_ibl_controls_mi100_linear.ster", replace
  file model_estimates/1a_ibl_controls_mi100_linear.ster saved

19. outreg2 using "tables/1a_ibl_controls_mi100_linear.rtf", replace word label onecol a
  > ddstat(Log-Likelihood, e(ll), chi-square test, r(chi2), F-test, e(p), Prob > F, r(p)
  > , R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > addnote("", "Sources: American Community Survey 2012-16 (U.S. Census Bureau 2018), C
  > ommon Core of Data 2015-16 (NCES 2018), and the author's data collection.") ///
  > title("TABLE 2", "Mixed Effects Models: Effects of Poverty & Race on IBL Emphasis")
  > ///
  > ctitle("M0: Controls only")
  tables/1a_ibl_controls_mi100_linear.rtf
  seeout

20.
21. * 1. school poverty
22. mi xeq 1 / 5: mixed inquiry_full_log povertyschool primary middle high lnage lnstude
  > nts urban pctpdfs || cmoname: ,

  m=1 data:
  -> mixed inquiry_full_log povertyschool primary middle high lnage lnstudents urban pct
  > pdfs || cmoname: ,

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  4535.8954
  Iteration 1:   log likelihood =  4535.8954

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      5,784
  Group variable: cmoname                         Number of groups  =        377

                                                  Obs per group:
                                                                min =          1
                                                                avg =       15.3
                                                                max =      3,737

                                                  Wald chi2(8)      =     242.33
  Log likelihood =  4535.8954                     Prob > chi2       =     0.0000
```

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertyschool	-.000622	.0000488	-12.74	0.000	-.0007178	-.0005263
primary	.0000598	.0038892	0.02	0.988	-.007563	.0076826
middle	-.0156265	.0058151	-2.69	0.007	-.0270238	-.0042292
high	-.0139035	.0046589	-2.98	0.003	-.0230349	-.0047721
lnage	-.0036663	.001606	-2.28	0.022	-.006814	-.0005187
lnstudents	.0079469	.0016784	4.73	0.000	.0046572	.0112365
urban	.0085227	.0031123	2.74	0.006	.0024227	.0146227
pctpdfs	.1100662	.0314445	3.50	0.000	.048436	.1716963
_cons	.1067329	.0119185	8.96	0.000	.083373	.1300927

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059226	.0006612	.0047586	.0073713
var(Residual)	.011339	.0002173	.010921	.0117731

LR test vs. linear model: chibar2(01) = **664.13** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed inquiry_full_log povertyschool primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4530.2699**
Iteration 1: log likelihood = **4530.2699**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **230.59**
Log likelihood = **4530.2699** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertyschool	**-.0005993**	**.0000488**	**-12.27**	**0.000**	**-.0006951**	**-.0005036**
primary	**.0003836**	**.0038929**	**0.10**	**0.922**	**-.0072464**	**.0080136**
middle	**-.0155108**	**.0058215**	**-2.66**	**0.008**	**-.0269207**	**-.0041009**
high	**-.0137644**	**.0046636**	**-2.95**	**0.003**	**-.0229049**	**-.0046239**
lnage	**-.0037329**	**.0016076**	**-2.32**	**0.020**	**-.0068836**	**-.0005822**
lnstudents	**.0079758**	**.0016802**	**4.75**	**0.000**	**.0046827**	**.0112689**
urban	**.0082639**	**.0031159**	**2.65**	**0.008**	**.0021568**	**.014371**
pctpdfs	**.1134357**	**.0314746**	**3.60**	**0.000**	**.0517466**	**.1751247**
_cons	**.1051015**	**.0119207**	**8.82**	**0.000**	**.0817373**	**.1284656**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	**.0058845**	**.0006579**	**.0047266**	**.0073261**
var(Residual)	**.0113651**	**.0002178**	**.0109461**	**.0118002**

LR test vs. linear model: chibar2(01) = **663.39** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed inquiry_full_log povertyschool primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4536.4826**
Iteration 1: log likelihood = **4536.4826**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **243.56**
Log likelihood = **4536.4826** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertyschool	-.0006246	.0000489	-12.78	0.000	-.0007204	-.0005289
primary	-6.17e-06	.0038889	-0.00	0.999	-.0076283	.007616
middle	-.0154231	.0058149	-2.65	0.008	-.0268201	-.0040262
high	-.0136459	.0046583	-2.93	0.003	-.022776	-.0045157
lnage	-.0037802	.0016057	-2.35	0.019	-.0069273	-.000633
lnstudents	.0080294	.0016779	4.79	0.000	.0047408	.011318
urban	.0085861	.0031125	2.76	0.006	.0024857	.0146865
pctpdfs	.1129486	.0314391	3.59	0.000	.051329	.1745682
_cons	.1064592	.0119092	8.94	0.000	.0831176	.1298008

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059279	.0006616	.0047632	.0073774
var(Residual)	.0113362	.0002173	.0109182	.0117702

LR test vs. linear model: chibar2(01) = **665.76** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed inquiry_full_log povertyschool primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4533.5754**
Iteration 1: log likelihood = **4533.5754**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **237.48**
Log likelihood = **4533.5754** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertyschool	-.0006142	.000049	-12.55	0.000	-.0007101	-.0005182
primary	.0000658	.0038909	0.02	0.987	-.0075603	.0076918
middle	-.0157603	.0058173	-2.71	0.007	-.027162	-.0043586
high	-.0139266	.0046609	-2.99	0.003	-.0230619	-.0047914
lnage	-.0036033	.0016067	-2.24	0.025	-.0067524	-.0004541
lnstudents	.0078942	.0016794	4.70	0.000	.0046026	.0111859
urban	.0085533	.003116	2.74	0.006	.0024461	.0146605
pctpdfs	.1125033	.031456	3.58	0.000	.0508506	.174156
_cons	.10646	.0119279	8.93	0.000	.0830817	.1298383

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059074	.0006607	.0047446	.0073553
var(Residual)	.0113497	.0002176	.0109313	.0117842

LR test vs. linear model: chibar2(01) = **662.70** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed inquiry_full_log povertyschool primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4531.4107**
Iteration 1: log likelihood = **4531.4107**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **232.97**
Log likelihood = **4531.4107** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertyschool	**-.0006046**	**.0000489**	**-12.37**	**0.000**	**-.0007004**	**-.0005087**
primary	**.0001481**	**.0038923**	**0.04**	**0.970**	**-.0074807**	**.0077769**
middle	**-.0155811**	**.00582**	**-2.68**	**0.007**	**-.0269881**	**-.0041742**
high	**-.0138516**	**.0046627**	**-2.97**	**0.003**	**-.0229903**	**-.004713**
lnage	**-.0037494**	**.0016072**	**-2.33**	**0.020**	**-.0068994**	**-.0005993**
lnstudents	**.0081309**	**.0016791**	**4.84**	**0.000**	**.0048399**	**.0114219**
urban	**.0082573**	**.0031142**	**2.65**	**0.008**	**.0021536**	**.014361**
pctpdfs	**.1130539**	**.0314679**	**3.59**	**0.000**	**.051378**	**.1747298**
_cons	**.1047692**	**.011907**	**8.80**	**0.000**	**.0814319**	**.1281066**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0059022**	**.0006596**	**.0047412**	**.0073475**
var(Residual)	**.011359**	**.0002177**	**.0109402**	**.0117939**

LR test vs. linear model: chibar2(01) = **663.43** Prob >= chibar2 = **0.0000**

23. mi est, dots post: mixed inquiry_full_log povertyschool primary middle high lnage ln
> students urban pctpdfs || cmoname: ,

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....
> ..80.....90.....100 done

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **5,784**

Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Average RVI = **0.0060**
Largest FMI = **0.0462**
DF adjustment: **Large sample** — DF: min = **46,423.46**
avg = **3.06e+07**
max = **7.71e+07**
Model F test: **Equal FMI** — F(**8**, **1.4e+07**) = **29.71**
Prob > F = **0.0000**

inquiry_full_log	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
povertyschool	-.0006169	.00005	-12.33	0.000	-.000715	-.0005189
primary	.0001876	.0038932	0.05	0.962	-.0074429	.0078182
middle	-.0155308	.0058207	-2.67	0.008	-.0269393	-.0041224
high	-.0137301	.0046637	-2.94	0.003	-.0228707	-.0045894
lnage	-.003696	.0016079	-2.30	0.022	-.0068474	-.0005445
lnstudents	.0080147	.001682	4.77	0.000	.0047181	.0113113
urban	.0085018	.0031191	2.73	0.006	.0023884	.0146152
pctpdfs	.1117951	.0314687	3.55	0.000	.0501176	.1734726
_cons	.1059151	.0119545	8.86	0.000	.0824846	.1293456

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
sd(_cons)	.0769144	.004297	.0689372	.0858147
sd(Residual)	.1065132	.0010223	.1045282	.1085358

24. est store ibl1

25. ereturn list

scalars:

```
              e(small) =  0
          e(nrgroups) =  1
              e(ll_c) =  .
              e(k_rs) =  2
                 e(N) =  5784
              e(df_c) =  .
              e(k_rc) =  0
                e(rc) =  0
                 e(k) =  11
            e(k_res) =  0
         e(converged) =  1
         e(se_failed) =  0
               e(k_r) =  2
                e(ll) =  .
            e(mecmd) =  0
           e(chi2_c) =  .
                e(ic) =  1
          e(nostderr) =  0
              e(df_m) =  .
                 e(p) =  .
               e(p_c) =  .
               e(k_f) =  9
              e(rank) =  .
              e(chi2) =  .
       e(_dfnote_mi) =  0
       e(mcerror_mi) =  0
         e(N_min_mi) =  5784
         e(N_max_mi) =  5784
       e(cilevel_mi) =  95
         e(k_exp_mi) =  0
      e(reparm_rc_mi) =  .
     e(k_eq_model_mi) =  3
         e(caller_mi) =  15.1
        e(df_min_mi) =  46423.4590381466
        e(df_avg_mi) =  30594167.74561116
        e(df_max_mi) =  77124625.80108543
       e(fmi_max_mi) =  .0462205493840805
       e(rvi_avg_mi) =  .0059643829007758
             e(p_mi) =  7.06561151504e-47
          e(ufmi_mi) =  0
       e(rvi_avg_F_mi) =  .0076249913244746
             e(F_mi) =  29.7085033075435
          e(df_m_mi) =  8
          e(df_r_mi) =  13691970.56552064
```

```
           e(df_c_mi) =  .
              e(N_mi) =  5784
              e(M_mi) =  100
       e(esampvary_mi) =  0

macros:
               e(cmd) : "mixed"
         e(rstructure) : "independent"
         e(rstructlab) : "Independent"
              e(iccok) : "ok"
              e(redim) : "1"
          e(optmetric) : "matsqrt"
  e(datasignaturevars) : "inquiry_full_log povertyschool primary middle high lnage lns
> tu.."
           e(vartypes) : "Identity"
              e(title) : "Mixed-effects ML regression"
          e(stripe_se) : "inquiry_full_log:povertyschool inquiry_full_log:primary inqu
> ir.."
           e(chi2type) : "Wald"
          e(ml_method) : "d0"
             e(depvar) : "inquiry_full_log"
                e(opt) : "moptimize"
           e(crittype) : "log likelihood"
             e(revars) : "_cons"
              e(ivars) : "cmoname"
             e(method) : "ML"
          e(technique) : "nr"
            e(cmdline) : "mixed inquiry_full_log povertyschool primary middle high lna
> ge.."
       e(names_vvl_mi) : "datasignature"
       e(names_vvs_mi) : "p chi2_c ll ll_c p_c chi2"
       e(names_vvm_mi) : "b_sd se_sd V_sd"
              e(m_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
         e(m_est_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
             e(rc_mi) : "0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> 0 .."
        e(dfadjust_mi) : "Large sample"
       e(modeltest_mi) : "Equal FMI"
           e(title_mi) : "Multiple-imputation estimates"
          e(prefix_mi) : "mi estimate"
             e(cmd_mi) : "mixed"
            e(ecmd_mi) : "mixed"
                e(mi) : "mi"
         e(cmdline_mi) : "mi estimate , dots post: mixed inquiry_full_log povertyschoo
> l .."
       e(_sortseed_mi) : "591981769XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
    e(_sortseedcmd_mi) : "949998345XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
         e(properties) : "b V"

matrices:
                  e(b) :  1 x 11
                  e(V) :  11 x 11
              e(b_sd) :  1 x 1
            e(noomit) :  1 x 9
           e(b_pclass) :  1 x 11
              e(g_min) :  1 x 1
              e(se_sd) :  1 x 1
              e(g_max) :  1 x 1
              e(g_avg) :  1 x 1
                e(N_g) :  1 x 1
               e(V_sd) :  1 x 1
              e(re_mi) :  1 x 11
             e(fmi_mi) :  1 x 11
            e(pise_mi) :  1 x 11
             e(rvi_mi) :  1 x 11
              e(df_mi) :  1 x 11
               e(W_mi) :  11 x 11
               e(B_mi) :  11 x 11
```

```
              e(V_mi) :  11 x 11
              e(b_mi) :  1 x 11
            e(N_g_mi) :  1 x 1
          e(g_min_mi) :  1 x 1
          e(g_avg_mi) :  1 x 1
          e(g_max_mi) :  1 x 1

26. est save "model_estimates/1b_ibl_povsch_mi100_linear.ster", replace
  file model_estimates/1b_ibl_povsch_mi100_linear.ster saved

27. outreg2 using "tables/1b_ibl_povsch_mi100_linear.rtf", replace word label onecol add
  > stat(Log-Likelihood, e(ll), chi-square test, r(chi2), F-test, e(p), Prob > F, r(p),
  > R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M1: School poverty")
  tables/1b_ibl_povsch_mi100_linear.rtf
  seeout

28.
29. * 2. school race
30. mi xeq 1 / 5: mixed inquiry_full_log pocschoolprop primary middle high lnage lnstude
  > nts urban pctpdfs || cmoname: ,

  m=1 data:
  -> mixed inquiry_full_log pocschoolprop primary middle high lnage lnstudents urban pct
  > pdfs || cmoname: ,

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  4546.9359
  Iteration 1:   log likelihood =  4546.9359

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      5,784
  Group variable: cmoname                         Number of groups  =        377

                                                  Obs per group:
                                                                min =          1
                                                                avg =       15.3
                                                                max =      3,737

                                                  Wald chi2(8)      =     265.33
  Log likelihood =  4546.9359                     Prob > chi2       =     0.0000
```

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocschoolprop	-.0732897	.0053914	-13.59	0.000	-.0838566	-.0627228
primary	.0060247	.0039007	1.54	0.122	-.0016206	.01367
middle	-.0091842	.0058368	-1.57	0.116	-.0206241	.0022558
high	-.0078431	.0046685	-1.68	0.093	-.0169933	.001307
lnage	-.0060696	.0016105	-3.77	0.000	-.0092261	-.0029131
lnstudents	.0124178	.0016899	7.35	0.000	.0091057	.01573
urban	.018826	.0033275	5.66	0.000	.0123043	.0253477
pctpdfs	.11415	.0313886	3.64	0.000	.0526295	.1756705
_cons	.0908025	.0115824	7.84	0.000	.0681015	.1135035

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0057	.000643	.0045694	.0071104
var(Residual)	.0113122	.0002168	.0108952	.0117452

LR test vs. linear model: chibar2(01) = **643.22** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed inquiry_full_log pocschoolprop primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4546.9359**
Iteration 1: log likelihood = **4546.9359**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **265.33**
Log likelihood = **4546.9359** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocschoolprop	**-.0732897**	**.0053914**	**-13.59**	**0.000**	**-.0838566**	**-.0627228**
primary	**.0060247**	**.0039007**	**1.54**	**0.122**	**-.0016206**	**.01367**
middle	**-.0091842**	**.0058368**	**-1.57**	**0.116**	**-.0206241**	**.0022558**
high	**-.0078431**	**.0046685**	**-1.68**	**0.093**	**-.0169933**	**.001307**
lnage	**-.0060696**	**.0016105**	**-3.77**	**0.000**	**-.0092261**	**-.0029131**
lnstudents	**.0124178**	**.0016899**	**7.35**	**0.000**	**.0091057**	**.01573**
urban	**.018826**	**.0033275**	**5.66**	**0.000**	**.0123043**	**.0253477**
pctpdfs	**.11415**	**.0313886**	**3.64**	**0.000**	**.0526295**	**.1756705**
_cons	**.0908025**	**.0115824**	**7.84**	**0.000**	**.0681015**	**.1135035**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0057**	**.000643**	**.0045694**	**.0071104**
var(Residual)	**.0113122**	**.0002168**	**.0108952**	**.0117452**

LR test vs. linear model: chibar2(01) = **643.22** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed inquiry_full_log pocschoolprop primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4546.9359**
Iteration 1: log likelihood = **4546.9359**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **265.33**
Log likelihood = **4546.9359** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocschoolprop	**-.0732897**	**.0053914**	**-13.59**	**0.000**	**-.0838566**	**-.0627228**
primary	**.0060247**	**.0039007**	**1.54**	**0.122**	**-.0016206**	**.01367**
middle	**-.0091842**	**.0058368**	**-1.57**	**0.116**	**-.0206241**	**.0022558**
high	**-.0078431**	**.0046685**	**-1.68**	**0.093**	**-.0169933**	**.001307**
lnage	**-.0060696**	**.0016105**	**-3.77**	**0.000**	**-.0092261**	**-.0029131**
lnstudents	**.0124178**	**.0016899**	**7.35**	**0.000**	**.0091057**	**.01573**
urban	**.018826**	**.0033275**	**5.66**	**0.000**	**.0123043**	**.0253477**
pctpdfs	**.11415**	**.0313886**	**3.64**	**0.000**	**.0526295**	**.1756705**
_cons	**.0908025**	**.0115824**	**7.84**	**0.000**	**.0681015**	**.1135035**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	**.0057**	**.000643**	**.0045694**	**.0071104**
var(Residual)	**.0113122**	**.0002168**	**.0108952**	**.0117452**

LR test vs. linear model: chibar2(01) = **643.22** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed inquiry_full_log pocschoolprop primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4546.9359**
Iteration 1: log likelihood = **4546.9359**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **265.33**
Log likelihood = **4546.9359** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocschoolprop	**-.0732897**	**.0053914**	**-13.59**	**0.000**	**-.0838566**	**-.0627228**
primary	**.0060247**	**.0039007**	**1.54**	**0.122**	**-.0016206**	**.01367**
middle	**-.0091842**	**.0058368**	**-1.57**	**0.116**	**-.0206241**	**.0022558**
high	**-.0078431**	**.0046685**	**-1.68**	**0.093**	**-.0169933**	**.001307**
lnage	**-.0060696**	**.0016105**	**-3.77**	**0.000**	**-.0092261**	**-.0029131**
lnstudents	**.0124178**	**.0016899**	**7.35**	**0.000**	**.0091057**	**.01573**
urban	**.018826**	**.0033275**	**5.66**	**0.000**	**.0123043**	**.0253477**
pctpdfs	**.11415**	**.0313886**	**3.64**	**0.000**	**.0526295**	**.1756705**
_cons	**.0908025**	**.0115824**	**7.84**	**0.000**	**.0681015**	**.1135035**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	**.0057**	**.000643**	**.0045694**	**.0071104**
var(Residual)	**.0113122**	**.0002168**	**.0108952**	**.0117452**

LR test vs. linear model: chibar2(01) = **643.22** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed inquiry_full_log pocschoolprop primary middle high lnage lnstudents urban pct**
> pdfs || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4546.9359**
Iteration 1: log likelihood = **4546.9359**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **265.33**
Log likelihood = **4546.9359** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocschoolprop	**-.0732897**	**.0053914**	**-13.59**	**0.000**	**-.0838566**	**-.0627228**
primary	**.0060247**	**.0039007**	**1.54**	**0.122**	**-.0016206**	**.01367**
middle	**-.0091842**	**.0058368**	**-1.57**	**0.116**	**-.0206241**	**.0022558**
high	**-.0078431**	**.0046685**	**-1.68**	**0.093**	**-.0169933**	**.001307**
lnage	**-.0060696**	**.0016105**	**-3.77**	**0.000**	**-.0092261**	**-.0029131**
lnstudents	**.0124178**	**.0016899**	**7.35**	**0.000**	**.0091057**	**.01573**
urban	**.018826**	**.0033275**	**5.66**	**0.000**	**.0123043**	**.0253477**
pctpdfs	**.11415**	**.0313886**	**3.64**	**0.000**	**.0526295**	**.1756705**
_cons	**.0908025**	**.0115824**	**7.84**	**0.000**	**.0681015**	**.1135035**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0057**	**.000643**	**.0045694**	**.0071104**
var(Residual)	**.0113122**	**.0002168**	**.0108952**	**.0117452**

LR test vs. linear model: chibar2(01) = **643.22** Prob >= chibar2 = **0.0000**

31. mi est, dots post: mixed inquiry_full_log pocschoolprop primary middle high lnage ln
> students urban pctpdfs || cmoname: ,

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....
> ..80.....90.....100 done

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **5,784**

Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Average RVI = **0.0000**
Largest FMI = **0.0000**
DF adjustment: **Large sample** — DF: min = **2.49e+63**
avg = **2.07e+64**
max = **.**

Model F test: **Equal FMI** — F(**8**, **6.4e+65**) = **33.17**
Prob > F = **0.0000**

inquiry_full_log	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
pocschoolprop	-.0732897	.0053914	-13.59	0.000	-.0838566	-.0627228
primary	.0060247	.0039007	1.54	0.122	-.0016206	.01367
middle	-.0091842	.0058368	-1.57	0.116	-.0206241	.0022558
high	-.0078431	.0046685	-1.68	0.093	-.0169933	.001307
lnage	-.0060696	.0016105	-3.77	0.000	-.0092261	-.0029131
lnstudents	.0124178	.0016899	7.35	0.000	.0091057	.01573
urban	.018826	.0033275	5.66	0.000	.0123043	.0253477
pctpdfs	.11415	.0313886	3.64	0.000	.0526295	.1756705
_cons	.0908025	.0115824	7.84	0.000	.0681015	.1135035

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
sd(_cons)	.0754984	.0042582	.0675972	.0843231
sd(Residual)	.1063588	.0010192	.1043798	.1083752

32. est store ibl2

33. ereturn list

scalars:

```
              e(small) =  0
          e(nrgroups) =  1
              e(ll_c) =  .
              e(k_rs) =  2
                 e(N) =  5784
              e(df_c) =  .
              e(k_rc) =  0
                e(rc) =  0
                 e(k) =  11
             e(k_res) =  0
          e(converged) =  1
          e(se_failed) =  0
                e(k_r) =  2
                e(ll) =  .
             e(mecmd) =  0
            e(chi2_c) =  .
                e(ic) =  1
           e(nostderr) =  0
              e(df_m) =  .
                 e(p) =  .
               e(p_c) =  .
               e(k_f) =  9
              e(rank) =  .
              e(chi2) =  .
        e(_dfnote_mi) =  1
        e(mcerror_mi) =  0
          e(N_min_mi) =  5784
          e(N_max_mi) =  5784
        e(cilevel_mi) =  95
          e(k_exp_mi) =  0
       e(reparm_rc_mi) =  .
      e(k_eq_model_mi) =  3
          e(caller_mi) =  15.1
          e(df_min_mi) =  2.48925792077e+63
          e(df_avg_mi) =  2.06991339817e+64
          e(df_max_mi) =  .
        e(fmi_max_mi) =  1.99426399495e-31
        e(rvi_avg_mi) =  2.61108928317e-32
              e(p_mi) =  9.65377936903e-53
           e(ufmi_mi) =  0
       e(rvi_avg_F_mi) =  3.49000597297e-32
              e(F_mi) =  33.16601464890604
           e(df_m_mi) =  8
           e(df_r_mi) =  6.43691384620e+65
```

```
            e(df_c_mi) =  .
               e(N_mi) =  5784
               e(M_mi) =  100
         e(esampvary_mi) =  0

macros:
                  e(cmd) : "mixed"
           e(rstructure) : "independent"
           e(rstructlab) : "Independent"
                e(iccok) : "ok"
                e(redim) : "1"
            e(optmetric) : "matsqrt"
  e(datasignaturevars) : "inquiry_full_log pocschoolprop primary middle high lnage lns
> tu.."
             e(vartypes) : "Identity"
                e(title) : "Mixed-effects ML regression"
            e(stripe_se) : "inquiry_full_log:pocschoolprop inquiry_full_log:primary inqu
> ir.."
             e(chi2type) : "Wald"
            e(ml_method) : "d0"
               e(depvar) : "inquiry_full_log"
                  e(opt) : "moptimize"
             e(crittype) : "log likelihood"
               e(revars) : "_cons"
                e(ivars) : "cmoname"
               e(method) : "ML"
            e(technique) : "nr"
              e(cmdline) : "mixed inquiry_full_log pocschoolprop primary middle high lna
> ge.."
        e(datasignature) : "5784:10:177867378:857791349"
                  e(m_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
             e(m_est_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
                e(rc_mi) : "0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> 0 .."
          e(dfadjust_mi) : "Large sample"
         e(modeltest_mi) : "Equal FMI"
             e(title_mi) : "Multiple-imputation estimates"
            e(prefix_mi) : "mi estimate"
               e(cmd_mi) : "mixed"
              e(ecmd_mi) : "mixed"
                   e(mi) : "mi"
           e(cmdline_mi) : "mi estimate , dots post: mixed inquiry_full_log pocschoolpro
> p .."
         e(_sortseed_mi) : "550156457XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
       e(_sortseedcmd_mi) : "1392645865XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa1
> 20.."
           e(properties) : "b V"

matrices:
                    e(b) :  1 x 11
                    e(V) :  11 x 11
                 e(b_sd) :  1 x 11
               e(noomit) :  1 x 9
             e(b_pclass) :  1 x 11
                e(g_min) :  1 x 1
                e(se_sd) :  1 x 11
                e(g_max) :  1 x 1
                e(g_avg) :  1 x 1
                  e(N_g) :  1 x 1
                 e(V_sd) :  11 x 11
                e(re_mi) :  1 x 11
               e(fmi_mi) :  1 x 11
              e(pise_mi) :  1 x 11
               e(rvi_mi) :  1 x 11
                e(df_mi) :  1 x 11
                 e(W_mi) :  11 x 11
                 e(B_mi) :  11 x 11
                 e(V_mi) :  11 x 11
                 e(b_mi) :  1 x 11
```

```
            e(N_g_mi) :  1 x 1
          e(g_min_mi) :  1 x 1
          e(g_avg_mi) :  1 x 1
          e(g_max_mi) :  1 x 1

34. est save "model_estimates/1c_ibl_pocsch_mi100_linear.ster", replace
  file model_estimates/1c_ibl_pocsch_mi100_linear.ster saved

35. outreg2 using "tables/1c_ibl_pocsch_mi100_linear.rtf", replace word label onecol add
  > stat(Log-Likelihood, e(ll), chi-square test, r(chi2), F-test, e(p), Prob > F, r(p),
  > R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M2: School race")
  tables/1c_ibl_pocsch_mi100_linear.rtf
  seeout

36.
37. * 3. school district poverty
38. mi xeq 1 / 5: mixed inquiry_full_log povertysd primary middle high lnage lnstudents
  > urban pctpdfs || cmoname: ,

  m=1 data:
  -> mixed inquiry_full_log povertysd primary middle high lnage lnstudents urban pctpdfs
  >  || cmoname: ,

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  4502.0876
  Iteration 1:   log likelihood =  4502.0876

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      5,784
  Group variable: cmoname                         Number of groups  =        377

                                                  Obs per group:
                                                               min =          1
                                                               avg =       15.3
                                                               max =      3,737

                                                  Wald chi2(8)      =     172.25
  Log likelihood =  4502.0876                     Prob > chi2       =     0.0000
```

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertysd	-.2121434	.0219958	-9.64	0.000	-.2552543	-.1690324
primary	.0004507	.0039121	0.12	0.908	-.0072168	.0081182
middle	-.0183831	.0058478	-3.14	0.002	-.0298444	-.0069217
high	-.0125412	.0046872	-2.68	0.007	-.0217279	-.0033545
lnage	-.0037433	.0016155	-2.32	0.020	-.0069095	-.000577
lnstudents	.0095382	.0016861	5.66	0.000	.0062335	.012843
urban	.0117328	.0032787	3.58	0.000	.0053067	.0181589
pctpdfs	.1132222	.0316292	3.58	0.000	.0512302	.1752143
_cons	.0904232	.0118158	7.65	0.000	.0672647	.1135817

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059256	.0006607	.0047624	.007373
var(Residual)	.0114778	.0002199	.0110547	.011917

LR test vs. linear model: chibar2(01) = **694.14** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed inquiry_full_log povertysd primary middle high lnage lnstudents urban pctpdfs**
> || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4501.2374**
Iteration 1: log likelihood = **4501.2374**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **170.50**
Log likelihood = **4501.2374** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertysd	**-.2106338**	**.022046**	**-9.55**	**0.000**	**-.2538432**	**-.1674243**
primary	**.0003957**	**.0039127**	**0.10**	**0.919**	**-.0072732**	**.0080645**
middle	**-.0182716**	**.0058485**	**-3.12**	**0.002**	**-.0297345**	**-.0068086**
high	**-.0125349**	**.004688**	**-2.67**	**0.007**	**-.0217231**	**-.0033467**
lnage	**-.003753**	**.0016157**	**-2.32**	**0.020**	**-.0069197**	**-.0005863**
lnstudents	**.0095205**	**.0016864**	**5.65**	**0.000**	**.0062153**	**.0128257**
urban	**.011659**	**.0032803**	**3.55**	**0.000**	**.0052297**	**.0180883**
pctpdfs	**.1131742**	**.0316342**	**3.58**	**0.000**	**.0511722**	**.1751761**
_cons	**.0903247**	**.0118192**	**7.64**	**0.000**	**.0671596**	**.1134899**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0059163**	**.0006599**	**.0047545**	**.007362**
var(Residual)	**.011482**	**.00022**	**.0110588**	**.0119215**

LR test vs. linear model: chibar2(01) = **694.05** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed inquiry_full_log povertysd primary middle high lnage lnstudents urban pctpdfs**
> || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4503.1892**
Iteration 1: log likelihood = **4503.1892**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **174.52**
Log likelihood = **4503.1892** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertysd	-.2150299	.0220315	-9.76	0.000	-.2582107	-.171849
primary	.0004363	.0039113	0.11	0.911	-.0072298	.0081023
middle	-.0183594	.0058466	-3.14	0.002	-.0298185	-.0069003
high	-.0125235	.0046863	-2.67	0.008	-.0217085	-.0033385
lnage	-.0037537	.0016151	-2.32	0.020	-.0069193	-.0005881
lnstudents	.0095505	.0016858	5.67	0.000	.0062463	.0128547
urban	.0118594	.0032779	3.62	0.000	.0054349	.0182839
pctpdfs	.1130678	.0316232	3.58	0.000	.0510874	.1750482
_cons	.0907476	.0118144	7.68	0.000	.0675919	.1139034

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059234	.0006603	.0047608	.0073699
var(Residual)	.0114734	.0002198	.0110505	.0119125

LR test vs. linear model: chibar2(01) = **695.27** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed inquiry_full_log povertysd primary middle high lnage lnstudents urban pctpdfs**
> || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4501.7009**
Iteration 1: log likelihood = **4501.7009**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **171.45**
Log likelihood = **4501.7009** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertysd	-.2117072	.022045	-9.60	0.000	-.2549147	-.1684997
primary	.0004381	.0039124	0.11	0.911	-.00723	.0081062
middle	-.0183668	.0058482	-3.14	0.002	-.029829	-.0069045
high	-.012443	.0046878	-2.65	0.008	-.0216309	-.0032552
lnage	-.0037709	.0016156	-2.33	0.020	-.0069373	-.0006045
lnstudents	.0095521	.0016863	5.66	0.000	.006247	.0128572
urban	.011702	.0032796	3.57	0.000	.0052742	.0181299
pctpdfs	.113367	.0316316	3.58	0.000	.0513703	.1753638
_cons	.0902527	.0118138	7.64	0.000	.0670981	.1134073

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0059145	.0006598	.004753	.0073599
var(Residual)	.0114803	.00022	.0110571	.0119196

LR test vs. linear model: chibar2(01) = **694.01** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed inquiry_full_log povertysd primary middle high lnage lnstudents urban pctpdfs**
> || cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4502.2854**
Iteration 1: log likelihood = **4502.2854**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **172.66**
Log likelihood = **4502.2854** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
povertysd	**-.2130835**	**.0220449**	**-9.67**	**0.000**	**-.2562907**	**-.1698764**
primary	**.000404**	**.0039119**	**0.10**	**0.918**	**-.0072632**	**.0080713**
middle	**-.0183205**	**.0058474**	**-3.13**	**0.002**	**-.0297812**	**-.0068597**
high	**-.0125087**	**.0046871**	**-2.67**	**0.008**	**-.0216952**	**-.0033223**
lnage	**-.0037756**	**.0016154**	**-2.34**	**0.019**	**-.0069417**	**-.0006095**
lnstudents	**.0095419**	**.0016861**	**5.66**	**0.000**	**.0062372**	**.0128466**
urban	**.0117727**	**.0032791**	**3.59**	**0.000**	**.0053458**	**.0181997**
pctpdfs	**.1133095**	**.0316278**	**3.58**	**0.000**	**.0513202**	**.1752988**
_cons	**.0906258**	**.0118195**	**7.67**	**0.000**	**.06746**	**.1137917**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0059329**	**.0006612**	**.0047687**	**.0073812**
var(Residual)	**.0114764**	**.0002199**	**.0110534**	**.0119156**

LR test vs. linear model: chibar2(01) = **695.99** Prob >= chibar2 = **0.0000**

39. mi est, dots post: mixed inquiry_full_log povertysd primary middle high lnage lnstud
> ents urban pctpdfs || cmoname: ,

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....
> ..80.....90.....100 done

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **5,784**

Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Average RVI = **0.0005**
Largest FMI = **0.0045**
DF adjustment: **Large sample** — DF: min = **4795763.51**
avg = **3.41e+10**
max = **2.76e+11**
Model F test: **Equal FMI** — F(**8**, **1.9e+09**) = **21.50**
Prob > F = **0.0000**

inquiry_full_log	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
povertysd	-.2123423	.0220844	-9.62	0.000	-.255627	-.1690577
primary	.0004151	.0039123	0.11	0.915	-.0072528	.008083
middle	-.0183418	.005848	-3.14	0.002	-.0298037	-.0068799
high	-.0125064	.0046875	-2.67	0.008	-.0216937	-.0033191
lnage	-.0037635	.0016156	-2.33	0.020	-.0069299	-.0005971
lnstudents	.0095321	.0016862	5.65	0.000	.0062272	.012837
urban	.0117418	.0032803	3.58	0.000	.0053125	.018171
pctpdfs	.1132819	.0316299	3.58	0.000	.0512885	.1752753
_cons	.09053	.0118199	7.66	0.000	.0673634	.1136967

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
sd(_cons)	.0769673	.0042913	.0689998	.0858547
sd(Residual)	.1071364	.0010265	.1051432	.1091673

40. est store ibl3

41. ereturn list

scalars:

```
            e(small) =  0
        e(nrgroups) =  1
            e(ll_c) =  .
            e(k_rs) =  2
               e(N) =  5784
            e(df_c) =  .
            e(k_rc) =  0
              e(rc) =  0
               e(k) =  11
           e(k_res) =  0
        e(converged) =  1
        e(se_failed) =  0
             e(k_r) =  2
              e(ll) =  .
           e(mecmd) =  0
         e(chi2_c) =  .
              e(ic) =  1
         e(nostderr) =  0
            e(df_m) =  .
               e(p) =  .
             e(p_c) =  .
             e(k_f) =  9
            e(rank) =  .
            e(chi2) =  .
      e(_dfnote_mi) =  0
      e(mcerror_mi) =  0
        e(N_min_mi) =  5784
        e(N_max_mi) =  5784
      e(cilevel_mi) =  95
        e(k_exp_mi) =  0
     e(reparm_rc_mi) =  .
    e(k_eq_model_mi) =  3
        e(caller_mi) =  15.1
       e(df_min_mi) =  4795763.510879963
       e(df_avg_mi) =  34119250936.85046
       e(df_max_mi) =  276408143337.5421
      e(fmi_max_mi) =  .0045438961559371
      e(rvi_avg_mi) =  .0004931363132356
            e(p_mi) =  4.92742577775e-33
        e(ufmi_mi) =  0
     e(rvi_avg_F_mi) =  .0006357265322766
            e(F_mi) =  21.49918674294984
       e(df_m_mi) =  8
       e(df_r_mi) =  1942418339.97201
```

```
            e(df_c_mi) =  .
               e(N_mi) =  5784
               e(M_mi) =  100
       e(esampvary_mi) =  0

macros:
                e(cmd) : "mixed"
         e(rstructure) : "independent"
         e(rstructlab) : "Independent"
              e(iccok) : "ok"
              e(redim) : "1"
          e(optmetric) : "matsqrt"
  e(datasignaturevars) : "inquiry_full_log povertysd primary middle high lnage lnstude
> nt.."
            e(vartypes) : "Identity"
               e(title) : "Mixed-effects ML regression"
           e(stripe_se) : "inquiry_full_log:povertysd inquiry_full_log:primary inquiry_
> fu.."
            e(chi2type) : "Wald"
           e(ml_method) : "d0"
              e(depvar) : "inquiry_full_log"
                e(opt) : "moptimize"
            e(crittype) : "log likelihood"
              e(revars) : "_cons"
               e(ivars) : "cmoname"
              e(method) : "ML"
           e(technique) : "nr"
             e(cmdline) : "mixed inquiry_full_log povertysd primary middle high lnage l
> ns.."
       e(names_vvl_mi) : "datasignature"
       e(names_vvs_mi) : "p chi2_c ll ll_c p_c chi2"
       e(names_vvm_mi) : "b_sd se_sd V_sd"
              e(m_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
          e(m_est_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
             e(rc_mi) : "0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> 0 .."
        e(dfadjust_mi) : "Large sample"
       e(modeltest_mi) : "Equal FMI"
           e(title_mi) : "Multiple-imputation estimates"
          e(prefix_mi) : "mi estimate"
             e(cmd_mi) : "mixed"
            e(ecmd_mi) : "mixed"
                e(mi) : "mi"
         e(cmdline_mi) : "mi estimate , dots post: mixed inquiry_full_log povertysd pr
> im.."
       e(_sortseed_mi) : "448227465XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
    e(_sortseedcmd_mi) : "1314406089XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa1
> 20.."
         e(properties) : "b V"

matrices:
                  e(b) :  1 x 11
                  e(V) :  11 x 11
              e(b_sd) :  1 x 1
            e(noomit) :  1 x 9
           e(b_pclass) :  1 x 11
              e(g_min) :  1 x 1
              e(se_sd) :  1 x 1
              e(g_max) :  1 x 1
              e(g_avg) :  1 x 1
                e(N_g) :  1 x 1
               e(V_sd) :  1 x 1
              e(re_mi) :  1 x 11
             e(fmi_mi) :  1 x 11
            e(pise_mi) :  1 x 11
             e(rvi_mi) :  1 x 11
              e(df_mi) :  1 x 11
               e(W_mi) :  11 x 11
               e(B_mi) :  11 x 11
```

```
              e(V_mi) :  11 x 11
              e(b_mi) :  1 x 11
            e(N_g_mi) :  1 x 1
          e(g_min_mi) :  1 x 1
          e(g_avg_mi) :  1 x 1
          e(g_max_mi) :  1 x 1

42. est save "model_estimates/1d_ibl_povsd_mi100_linear.ster", replace
  file model_estimates/1d_ibl_povsd_mi100_linear.ster saved

43. outreg2 using "tables/1d_ibl_povsd_mi100_linear.rtf", replace word label onecol adds
  > tat(Log-Likelihood, e(ll), chi-square test, r(chi2), F-test, e(p), Prob > F, r(p), R
  > -squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M3: School district poverty")
  tables/1d_ibl_povsd_mi100_linear.rtf
  seeout

44.
45. * 4. school district race
46. mi xeq 1 / 5: mixed inquiry_full_log pocsd primary middle high lnage lnstudents urba
  > n pctpdfs || cmoname: ,

  m=1 data:
  -> mixed inquiry_full_log pocsd primary middle high lnage lnstudents urban pctpdfs ||
  > cmoname: ,

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  4461.9662
  Iteration 1:   log likelihood =  4461.9662

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      5,784
  Group variable: cmoname                         Number of groups  =        377

                                                  Obs per group:
                                                                min =          1
                                                                avg =       15.3
                                                                max =      3,737

                                                  Wald chi2(8)      =      90.20
  Log likelihood =  4461.9662                     Prob > chi2       =     0.0000
```

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocsd	-.0299864	.0086666	-3.46	0.001	-.0469727	-.0130001
primary	.00162	.0039461	0.41	0.681	-.0061142	.0093541
middle	-.0163468	.0059028	-2.77	0.006	-.0279161	-.0047774
high	-.0129002	.0047218	-2.73	0.006	-.0221547	-.0036456
lnage	-.004403	.0016318	-2.70	0.007	-.0076014	-.0012047
lnstudents	.0101389	.0017212	5.89	0.000	.0067654	.0135125
urban	.005006	.0033476	1.50	0.135	-.0015552	.0115671
pctpdfs	.1140002	.0318573	3.58	0.000	.051561	.1764393
_cons	.0691831	.0116363	5.95	0.000	.0463763	.0919899

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	.0058117	.0006573	.0046563	.0072539
var(Residual)	.0116543	.0002233	.0112247	.0121004

LR test vs. linear model: chibar2(01) = **654.57** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed inquiry_full_log pocsd primary middle high lnage lnstudents urban pctpdfs ||**
> cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4462.07**
Iteration 1: log likelihood = **4462.07**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **90.41**
Log likelihood = **4462.07** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocsd	**-.0302714**	**.0086739**	**-3.49**	**0.000**	**-.047272**	**-.0132708**
primary	**.0016246**	**.003946**	**0.41**	**0.681**	**-.0061094**	**.0093586**
middle	**-.0163327**	**.0059028**	**-2.77**	**0.006**	**-.0279019**	**-.0047634**
high	**-.0128758**	**.0047219**	**-2.73**	**0.006**	**-.0221305**	**-.003621**
lnage	**-.0044073**	**.0016318**	**-2.70**	**0.007**	**-.0076056**	**-.001209**
lnstudents	**.0101522**	**.0017214**	**5.90**	**0.000**	**.0067783**	**.0135261**
urban	**.0050338**	**.0033464**	**1.50**	**0.133**	**-.001525**	**.0115926**
pctpdfs	**.113958**	**.031857**	**3.58**	**0.000**	**.0515195**	**.1763966**
_cons	**.0691987**	**.0116354**	**5.95**	**0.000**	**.0463937**	**.0920038**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.0058075**	**.000657**	**.0046526**	**.0072491**
var(Residual)	**.0116542**	**.0002233**	**.0112246**	**.0121003**

LR test vs. linear model: chibar2(01) = **653.75** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed inquiry_full_log pocsd primary middle high lnage lnstudents urban pctpdfs ||**
> cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4462.3417**
Iteration 1: log likelihood = **4462.3417**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **90.96**
Log likelihood = **4462.3417** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocsd	**-.0309252**	**.0086696**	**-3.57**	**0.000**	**-.0479173**	**-.0139331**
primary	**.0016626**	**.0039461**	**0.42**	**0.674**	**-.0060717**	**.0093968**
middle	**-.0163292**	**.005902**	**-2.77**	**0.006**	**-.0278969**	**-.0047616**
high	**-.0128581**	**.0047217**	**-2.72**	**0.006**	**-.0221125**	**-.0036037**
lnage	**-.0044219**	**.0016318**	**-2.71**	**0.007**	**-.0076203**	**-.0012235**
lnstudents	**.010183**	**.0017217**	**5.91**	**0.000**	**.0068084**	**.0135575**
urban	**.0051249**	**.0033453**	**1.53**	**0.126**	**-.0014319**	**.0116816**
pctpdfs	**.1139272**	**.0318554**	**3.58**	**0.000**	**.0514918**	**.1763626**
_cons	**.0692225**	**.0116342**	**5.95**	**0.000**	**.0464198**	**.0920251**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	**.0058098**	**.0006572**	**.0046545**	**.0072517**
var(Residual)	**.0116529**	**.0002233**	**.0112233**	**.0120989**

LR test vs. linear model: chibar2(01) = **654.06** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed inquiry_full_log pocsd primary middle high lnage lnstudents urban pctpdfs ||**
> cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4462.1724**
Iteration 1: log likelihood = **4462.1724**

Computing standard errors:

Mixed-effects ML regression Number of obs = **5,784**
Group variable: **cmoname** Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **90.62**
Log likelihood = **4462.1724** Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocsd	**-.0305355**	**.0086767**	**-3.52**	**0.000**	**-.0475415**	**-.0135294**
primary	**.0016406**	**.0039461**	**0.42**	**0.678**	**-.0060935**	**.0093748**
middle	**-.0163507**	**.0059022**	**-2.77**	**0.006**	**-.0279187**	**-.0047827**
high	**-.0128708**	**.0047218**	**-2.73**	**0.006**	**-.0221254**	**-.0036162**
lnage	**-.0044053**	**.0016317**	**-2.70**	**0.007**	**-.0076033**	**-.0012073**
lnstudents	**.0101626**	**.0017215**	**5.90**	**0.000**	**.0067886**	**.0135367**
urban	**.0050783**	**.0033471**	**1.52**	**0.129**	**-.0014819**	**.0116385**
pctpdfs	**.113966**	**.0318564**	**3.58**	**0.000**	**.0515286**	**.1764035**
_cons	**.0691853**	**.0116341**	**5.95**	**0.000**	**.0463828**	**.0919878**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
var(_cons)	**.0058053**	**.0006568**	**.0046508**	**.0072465**
var(Residual)	**.011654**	**.0002233**	**.0112244**	**.0121**

LR test vs. linear model: chibar2(01) = **653.52** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed inquiry_full_log pocsd primary middle high lnage lnstudents urban pctpdfs ||**
> cmoname: ,

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **4461.9948**
Iteration 1: log likelihood = **4461.9948**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **5,784**
Group variable: **cmoname** — Number of groups = **377**

Obs per group:
min = **1**
avg = **15.3**
max = **3,737**

Wald chi2(**8**) = **90.26**
Log likelihood = **4461.9948** — Prob > chi2 = **0.0000**

inquiry_full_log	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
pocsd	**-.0300263**	**.0086575**	**-3.47**	**0.001**	**-.0469947**	**-.0130578**
primary	**.0016175**	**.003946**	**0.41**	**0.682**	**-.0061164**	**.0093515**
middle	**-.0163737**	**.0059022**	**-2.77**	**0.006**	**-.0279417**	**-.0048056**
high	**-.012893**	**.0047218**	**-2.73**	**0.006**	**-.0221476**	**-.0036384**
lnage	**-.0043927**	**.0016316**	**-2.69**	**0.007**	**-.0075905**	**-.0011949**
lnstudents	**.0101454**	**.0017214**	**5.89**	**0.000**	**.0067715**	**.0135193**
urban	**.0049939**	**.003345**	**1.49**	**0.135**	**-.0015623**	**.01155**
pctpdfs	**.1139776**	**.0318571**	**3.58**	**0.000**	**.0515389**	**.1764163**
_cons	**.0691857**	**.0116366**	**5.95**	**0.000**	**.0463783**	**.0919931**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity var(_cons)	**.005816**	**.0006577**	**.0046598**	**.007259**
var(Residual)	**.0116538**	**.0002233**	**.0112242**	**.0120999**

LR test vs. linear model: chibar2(01) = **654.32** Prob >= chibar2 = **0.0000**

47. mi est, dots post: mixed inquiry_full_log pocsd primary middle high lnage lnstudents
> urban pctpdfs || cmoname: ,

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....
> ..80.....90.....100 done

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **5,784**

Group variable: **cmoname** — Number of groups = **377**
Obs per group:
min = **1**
avg = **15.3**
max = **3,737**
Average RVI = **0.0004**
Largest FMI = **0.0044**
DF adjustment: **Large sample** — DF: min = **5129910.70**
avg = **9.95e+11**
max = **9.62e+12**
Model F test: **Equal FMI** — F(**8**, **2.5e+09**) = **11.29**
Prob > F = **0.0000**

inquiry_full_log	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
pocsd	-.0302451	.0086905	-3.48	0.001	-.0472781	-.013212
primary	.0016248	.0039461	0.41	0.681	-.0061093	.0093589
middle	-.0163598	.0059024	-2.77	0.006	-.0279283	-.0047913
high	-.0128783	.0047219	-2.73	0.006	-.0221331	-.0036235
lnage	-.0044066	.0016318	-2.70	0.007	-.007605	-.0012082
lnstudents	.0101561	.0017217	5.90	0.000	.0067816	.0135307
urban	.0050337	.0033477	1.50	0.133	-.0015277	.0115951
pctpdfs	.1139769	.0318569	3.58	0.000	.0515385	.1764154
_cons	.069171	.0116352	5.94	0.000	.0463664	.0919756

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
cmoname: Identity				
sd(_cons)	.0762172	.0043107	.0682198	.0851522
sd(Residual)	.1079543	.0010344	.1059457	.1100009

48. est store ibl4

49. ereturn list

scalars:

```
              e(small) =  0
          e(nrgroups) =  1
              e(ll_c) =  .
              e(k_rs) =  2
                 e(N) =  5784
              e(df_c) =  .
              e(k_rc) =  0
                e(rc) =  0
                 e(k) =  11
             e(k_res) =  0
          e(converged) =  1
          e(se_failed) =  0
                e(k_r) =  2
                e(ll) =  .
             e(mecmd) =  0
            e(chi2_c) =  .
                e(ic) =  1
           e(nostderr) =  0
              e(df_m) =  .
                 e(p) =  .
               e(p_c) =  .
               e(k_f) =  9
              e(rank) =  .
              e(chi2) =  .
        e(_dfnote_mi) =  0
        e(mcerror_mi) =  0
          e(N_min_mi) =  5784
          e(N_max_mi) =  5784
        e(cilevel_mi) =  95
          e(k_exp_mi) =  0
       e(reparm_rc_mi) =  .
      e(k_eq_model_mi) =  3
          e(caller_mi) =  15.1
          e(df_min_mi) =  5129910.702917462
          e(df_avg_mi) =  994824813769.557
          e(df_max_mi) =  9623946240492.328
        e(fmi_max_mi) =  .0043934032428896
        e(rvi_avg_mi) =  .0004112334205701
              e(p_mi) =  3.95204055410e-16
           e(ufmi_mi) =  0
       e(rvi_avg_F_mi) =  .0005591298832223
              e(F_mi) =  11.2935127518249
           e(df_m_mi) =  8
           e(df_r_mi) =  2510680077.447865
```

```
           e(df_c_mi) =  .
              e(N_mi) =  5784
              e(M_mi) =  100
       e(esampvary_mi) =  0

macros:
                e(cmd) : "mixed"
         e(rstructure) : "independent"
         e(rstructlab) : "Independent"
              e(iccok) : "ok"
              e(redim) : "1"
          e(optmetric) : "matsqrt"
  e(datasignaturevars) : "inquiry_full_log pocsd primary middle high lnage lnstudents
> ur.."
           e(vartypes) : "Identity"
              e(title) : "Mixed-effects ML regression"
          e(stripe_se) : "inquiry_full_log:pocsd inquiry_full_log:primary inquiry_full
> _l.."
           e(chi2type) : "Wald"
          e(ml_method) : "d0"
             e(depvar) : "inquiry_full_log"
                e(opt) : "moptimize"
           e(crittype) : "log likelihood"
             e(revars) : "_cons"
              e(ivars) : "cmoname"
             e(method) : "ML"
          e(technique) : "nr"
            e(cmdline) : "mixed inquiry_full_log pocsd primary middle high lnage lnstu
> de.."
       e(names_vvl_mi) : "datasignature"
       e(names_vvs_mi) : "p chi2_c ll ll_c p_c chi2"
       e(names_vvm_mi) : "b_sd se_sd V_sd"
              e(m_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
         e(m_est_mi) : "1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
> 24.."
             e(rc_mi) : "0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> 0 .."
        e(dfadjust_mi) : "Large sample"
       e(modeltest_mi) : "Equal FMI"
           e(title_mi) : "Multiple-imputation estimates"
          e(prefix_mi) : "mi estimate"
             e(cmd_mi) : "mixed"
            e(ecmd_mi) : "mixed"
                e(mi) : "mi"
         e(cmdline_mi) : "mi estimate , dots post: mixed inquiry_full_log pocsd primar
> y .."
       e(_sortseed_mi) : "1778809961XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa1
> 20.."
    e(_sortseedcmd_mi) : "393857705XZA112210f4b16c1cb10507a1f38cb440c40003c9a83566fa12
> 01.."
         e(properties) : "b V"

matrices:
                  e(b) :  1 x 11
                  e(V) :  11 x 11
              e(b_sd) :  1 x 1
            e(noomit) :  1 x 9
           e(b_pclass) :  1 x 11
              e(g_min) :  1 x 1
              e(se_sd) :  1 x 1
              e(g_max) :  1 x 1
              e(g_avg) :  1 x 1
                e(N_g) :  1 x 1
               e(V_sd) :  1 x 1
              e(re_mi) :  1 x 11
             e(fmi_mi) :  1 x 11
            e(pise_mi) :  1 x 11
             e(rvi_mi) :  1 x 11
              e(df_mi) :  1 x 11
               e(W_mi) :  11 x 11
               e(B_mi) :  11 x 11
```

```
               e(V_mi) :  11 x 11
               e(b_mi) :  1 x 11
             e(N_g_mi) :  1 x 1
           e(g_min_mi) :  1 x 1
           e(g_avg_mi) :  1 x 1
           e(g_max_mi) :  1 x 1

50. est save "model_estimates/1e_ibl_pocsd_mi100_linear.ster", replace
  file model_estimates/1e_ibl_pocsd_mi100_linear.ster saved

51. outreg2 using "tables/1e_ibl_pocsd_mi100_linear.rtf", replace word label onecol adds
  > tat(Log-Likelihood, e(ll), chi-square test, r(chi2), F-test, e(p), Prob > F, r(p), R
  > -squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M4: School district race")
  tables/1e_ibl_pocsd_mi100_linear.rtf
  seeout

52.
53. log close
        name:  <unnamed>
         log:  /hdir/0/jhaber/Projects/charter_data/sorting-schools-2019/logs/results_1_
  > ibl_mi100_linear_101019.smcl
    log type:  smcl
   closed on:  18 Oct 2019, 14:59:32
  ------------------------------------------------------------------------------------------
```