

C15Q06

(a)

The results seem quite similar.

The heterogeneity is not significant.

(b)

The data is cross-sectional in part (a), using OLS to estimate.

In part (b), the data is panel data. The individual-specific effect may exist.

(c)

The coefficient of EXPER shows the most difference .

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(d)

H0: $u_i = 0$ (no individual-specific effects)

H1: $u_i \neq 0$ (individual-specific effects)

df = (N-1, N(T-1)-K) = (715, 711)

1% critical value: 1.190575

=> reject H0, there exist individual –specific effects.

(e)

Without cluster-robust standard errors:

Assumes that no correlation between observations.

With cluster-robust standard errors:

There are within-group correlations.

SOUTH are substantially different, and the robust one is larger.

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(a)

| | Estimate | Std. Error | t value | Pr(> t) |
|-------------|-------------|------------|-------------|--------------|
| (Intercept) | 437.7642527 | 1.3462212 | 325.1800198 | 0.000000e+00 |
| small | 5.8228158 | 0.9893333 | 5.8855960 | 4.189826e-09 |
| aide | 0.8178369 | 0.9529935 | 0.8581768 | 3.908306e-01 |
| tchexper | 0.4924687 | 0.0695551 | 7.0802669 | 1.610506e-12 |
| boy | -6.1564214 | 0.7961282 | -7.7329526 | 1.232255e-14 |
| white_asian | 3.9058095 | 0.9536072 | 4.0958264 | 4.264330e-05 |
| freelunch | -14.7713371 | 0.8902481 | -16.5923825 | 1.965023e-60 |

Yes, students perform better when they are in small classes.

No, teacher's aide doesn't improve scores.

Yes, students of more experienced teachers score higher.

Yes, student's sex or race make a difference.

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(b)

| | Estimate | Std. Error | t-value | Pr(> t) |
|-------------|-------------|------------|------------|--------------|
| small | 6.4902305 | 0.91296175 | 7.108984 | 1.312946e-12 |
| aide | 0.9960875 | 0.88169306 | 1.129744 | 2.586318e-01 |
| tchexper | 0.2855668 | 0.07084451 | 4.030895 | 5.629160e-05 |
| boy | -5.4559412 | 0.72758937 | -7.498654 | 7.439670e-14 |
| white_asian | 8.0280192 | 1.53565617 | 5.227745 | 1.777245e-07 |
| freelunch | -14.5935724 | 0.88000649 | -16.583483 | 2.362112e-60 |

No, the conclusions haven't chaged.

(c)

F test for individual effects

```
data:  readscore ~ small + aide + tchexper + boy + white_asian + freelunch
F = 16.698, df1 = 78, df2 = 5681, p-value < 2.2e-16
alternative hypothesis: significant effects
```

Reject H0, it suggests that school fixed effects are significant.

C15Q17

(a)

Coefficients:

| | Estimate | Std. Error | t value | Pr(> t) |
|---------|----------|------------|---------|----------|
| INCOMED | 0.02975 | 0.02922 | 1.018 | 0.312 |

| | 2.5 % | 97.5 % |
|---------|-------------|------------|
| INCOMED | -0.02841457 | 0.08790818 |