

Tutorial 9 - ECON3360

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The foreach Loop in Stata

- ▶ A command to iterate over lists.
- ▶ Executes a series of commands for each item in the list.
- ▶ Syntax:

```
foreach var in item1 item2 ...{  
    command `var'  
}
```

Summary of Q5

- ▶ Test scores tend to be higher for larger classes (correlation!), but as controls are added the correlations disappear and the relationship between class size and tests scores become insignificant.
- ▶ This suggests the presence of OVB: at least the % of disadvantaged students and the size of the school are associated with class sizes and test scores.
- ▶ There are possibly other unobserved factors – ϵ we can't rely on OLS to estimate causality.

Maimonides' Rule

$$f_{sc} = \frac{\text{enrollment}}{\text{int} \left(\frac{1}{40} (\text{enrollment} - 1) \right) + 1} \quad (1)$$

- ▶ This captures the fact that following Maimonides' rule, schools with 1–40 students have 1 class;
- ▶ schools with 41–80 are split into two classes of average size 20.5–40;
- ▶ schools of 81–120 are split into three classes of average size 27–40, and so on.
- ▶ f_{sc} is the theoretical prediction of class sizes according to the Maimonides rule (i.e. the bit in class sizes that vary exogenously around the threshold)
- ▶ In practice, schools do not necessarily divide their cohort into classes of equal size. In schools with two classes per grade, for example, only about one-quarter of the classes are of equal size.

Summary of Q7

- ▶ This regression is the reduced form in the RDD.
- ▶ Now we find a negative effect: being in a theoretically larger class has a negative impact on reading and math scores.
- ▶ 1 more theoretical person in the class lowers math and reading scores by about 0.13 points and the effect is significant.

Summary of Q9

- ▶ When the theoretical number of students per class increases by 1, the actual number of students increases by 0.5: Maimonides' rule is broadly followed but not a 100
- ▶ Note that the first stage estimate 0.48 is $RF/2SLS = 0.13/0.28$.

Summary

- ▶ Instrumental variables estimates constructed by using functions of Maimonides' rule as instruments for class size.
- ▶ While controlling for enrollment and pupil background consistently show a negative effect of larger classes on student achievement.
- ▶ Observational studies are often confounded by a failure to isolate a credible source of exogenous variation in school inputs (like class size).
- ▶ The regression-discontinuity research design overcomes these problems of confounding factors by exploiting exogenous variation that stems from administrative rules.
 - ▶ As in randomized trials like the STAR experiment, when this sort of exogenous variation is used to study class size, smaller classes appear beneficial.
- ▶ These reductions in the class size are beneficial for students, but clearly expensive to implement.