

This Quiz is due on Sun, Oct. 29th, 8pm

We are now entering the **third phase** of the class, which is **about well established methods**, how they work and how to implement them empirically. The good news is, that it is a small “Reset”, and you can do well in this part, almost independently about how confident you are in what we heard until now. (The books are better and there is a lot of other literature too; Identification will appear, but mostly to motivate the methods.)

- 1.) New class time: Following the majority vote, the class is now from 3-6.
- 2.) Reading Assignment: Please read in Angrist and Pischke
 - Chapter 4
 - Chapter 6
 - Also skim over Chapter 5.
- 3.) Revisit the steps that need to be taken in a standard 2SLS - IV Estimation.
 - a. Briefly sketch the IV Setup and the IV-Estimator
 - b. Briefly sketch the steps that you have to take in the estimation.
 - c. Hint: Think of the first and second stage in the estimation.
- 4.) Do the exercises on the next page.

Outlook: After next week,

We will cover Panel and Diff in Diff.

⇒ Chapter 5 in Angrist Pischke and Chapter 19 in Hanson

We will then turn to linear Instrumental Variables, the method of Moments and GMM (based on Hanson)

7022MK PhD ECONOMETRICS I (fall 2017)
Quiz for Week 10 (October 24, 2017); Due on Oct. 29th, 8pm.

Omitted Variables:

You regressed earnings on schooling, and got that another year of schooling gives on average 79c additional hourly wage. Now, you suspect, that ability/intelligence might be confounding your results.

(i) Assume intelligence can be measured on a scale (ranging from 1-48) that strongly correlates with years of schooling (on average, students with one additional point on the scale complete one additional completed year). (ii) Assume further, that one point more on the scale is associated with 4c higher earnings/hour.

- Formalize the assumptions above.
- By how much are your original estimates off, if your assumptions about intelligence/ability are correct?
compute the omitted variable bias.

Omitted variables as code

Implement the theoretical question on OVB also as code.

- Following the example on the slides, generate the (y, X, Z) as (earnings, education, ability) using the assumptions I gave.
- Provide the estimation of the real model.
- Replicate the biased 79c estimate of the “truncated model” (the one without ability).
- Explain what happens

*Note, you have to use the computed ‘unbiased effect’ to generate the data.

IQ as IV or as proxy?

You now consider using a measure of IQ as proxy. Assume the IQ-test is positively correlated with ability. Let $Corr(ability, IQ) = 0.7$, and it is even more correlated with schooling $Corr(ability, schooling) = 0.8$

- Which variable would you instrument with IQ? What are the assumptions that a good instrument has to satisfy? Are the assumptions satisfied? Comment?
- IF you use IQ as proxy, then for which variable would you do so? What are the requirements for a good proxy? are they satisfied here?
- Specifically, if you use IQ as proxy variable in the problem above, will you reduce or aggravate the OVB above. By how much would you reduce/aggravate the problem?
- What is your conclusion about how to best use the IQ score? Better as IV, or better as Proxy?