Assessing the Instrument - Quiz

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Question 1

1.0/1.0 point (graded)

A good instrument needs to: (Select all that apply)

- [x] a. Be correlated with your regressor of interest
- [x] b. Randomly assigned or as good as randomly assigned
- [x] c. Have no direct effect on the outcome variable of interest.
- [ ] d. Positively correlated with the outcome variable

✔

Explanation

If the instrument is not correlated with the regressor, then it will not produce variation in the regressor. If the instrument is not randomly assigned, then the instrument may not produce only exogenous variation in the regressor. If the instrument directly affected the outcome variable, then

we could not distinguish between the effect from the variation in the regressor and the direct effect. Positive correlation with the outcome variable is irrelevant.

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Question 2

1.0/1.0 point (graded)

Which of the conditions for a good instrument **cannot** be tested or proven empirically? (Select all that apply)

- [ ] a. Your instrument is correlated with your regressor of interest.
- [ ] b. Your instrument is randomly or as good as randomly assigned.
- [x] c. Your instrument has no direct effect on Y
- [ ] d. They can all be tested.

✔

Explanation

We can test A very easily by regressing the regressor on the instrument. With an RCT, B is guaranteed (in other cases, we might need to assume this, however, you can show that the instrument is uncorrelated with other observable baseline characteristics to support your claim

that this assumption holds). We cannot test C, because the direct effect on Y and the indirect effect (through the instrumented for regressor) cannot be disentangled. The key assumption underlying any IV strategy is that the only impact of your instrument on your outcome (test scores) is through your instruments' effect on your regressor (attendance). This is commonly known as the "exclusion restriction."

This is not an assumption you can test or prove empirically, but you can try and think of what other variables might be affected by your instrument and affect your outcome of interest and try to find evidence in support of your claim.

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Question 3

1.0/1.0 point (graded)

Which of the following statements represent the assumption that the "exclusion restriction" is satisfied in this context?

- a. $E[\epsilon_i \mid Z_i = 1] - E[\epsilon_i \mid Z_i = 0] = 0$ ✔
- b. $E[A_i \mid Z_i = 1] - E[A_i \mid Z_i = 0] \neq 0$
- c. $E[X_i \mid Z_i = 1] - E[X_i \mid Z_i = 0] = 0$, where X_i is a vector of observable baseline characteristics.

Homework due Dec 12, 2016 05:00 IST

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d. $E[Y_i \mid Z_i = 1] - E[Y_i \mid Z_i = 0] \neq 0$

Explanation

As explained, the exclusion restriction refers to the assumption that is that the only impact of your instrument on your outcome (test scores) is through your instruments' effect on your regressor (attendance). This requires that there is no omitted variable in your model which is correlated with both assignment and test scores. This will only be true if your error term is uncorrelated with your instrument.

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Discussion

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