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Endogeneity vs. OVB - Quiz

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Question 1

1/1 point (graded)

Suppose you are interested in estimating the following relationships using a simple OLS model. In each case, you regress the first variable on the second variable. For which of these are you likely to have an omitted variable problem?

- a. Incarceration rates and police presence
- b. Grades and class attendance
- c. Cancer and smoking
- d. All of the above ✔

Explanation

In all the cases above, it is highly likely that there are variables that are correlated with both the outcome and the regressor that are missing from this simple model. So your estimates are likely to be biased because there is an omitted variable problem.

For example, consider the following possible stories in each of these scenarios:

For A, places with higher incarceration rates might have more crime, leading to more arrests, and law enforcement might be more present in places where there is more crime.

For B, better (smarter) students might be more likely to attend class because they are smart, and it is easier and more enjoyable for them. And smarter students are probably more likely to get better grades irrespective of whether they attend class.

For C, smokers in the US are more like to be low-educated and live below the poverty line. Belonging to this demographic may in turn expose them to other carcinogens (cancer-causing substances), either through their occupation or their environments. Alternatively, other behaviors, such as increased alcohol consumption along with smoking further increase the risk of cancer.

Submit You have used 2 of 2 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

Suppose you are interested in estimating the following relationships using a simple OLS model, for which of the following cases are you likely to have an endogeneity problem? Again, your regress the first variable on the second variable. (Select all that apply)

- [x] a. Income and democracy
- [ ] b. Mothers' education and children's immunization rates
- [x] c. Sleep and coffee consumption
- [ ] d. Cancer and smoking
- [ ] e. The price of fish and the weather

✔

Explanation
B, D and E are unlikely to have an endogeneity problem because the relationship is unlikely to go both ways. In B, mother's education might affect childrens' immunization rates, but whether or not a child is immunized probably doesn't influence their mothers' education (although there may still be an omitted variable bias). Likewise, for E, we might expect the price of fish to be influenced by the weather, but it is definitely not the case that the price of fish affects the weather in any way.

On the other hand, estimating the relationships in A and C using a simple OLS model might conflate the effect of the regressor on the outcome with the effect of the outcome on the regressor. In A, democracy might increase GDP, but richer countries might be more likely to democratize. In C, drinking coffee might lead to sleeplessness and a poor night's sleep. In turn, a poor night's sleep makes people more tired, which might lead to higher coffee consumption.

Submit You have used 1 of 2 attempts

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Discussion
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