# Quiz 5

# Instructions

For questions 6-10, you need to dataset hprice2 from wooldridge library in R.

Suppose you are interested in the effect of pollution on House Prices. You use dataset available in R, **hprice2** from ***wooldridge library***,  for 506 regions on *nox* (nitric oxide concentration in the air, parts per 100m), *crime* (crimes committed per capita), *price* (median house prices in the region in 1000 $), *rooms* (average number of rooms ), *dist* (weighted distance to 5 employment centers), and *proptax* (property tax per $1000) and *stratio* (the average student to teacher ratio in the school district).

You estimate 3 regressions:

Regr 1: Regress house prices (in thousands USD) on nox, stratio

Regr 2: Regress house prices (in thousands USD) on nox, stratio, rooms

Regr 3: Regress house prices (in thousands USD) on nox, stratio, rooms, and dist

Display all regression results into a stargazer table with heteroskedasticity robust standard errors.

## Question 1

1 / 1 pts

The overall regression *F*-statistic tests the null hypothesis that

- all slope coefficients and the intercept are zero.
- the slope coefficient of the variable of interest is zero, but that the other slope coefficients are not.
- the intercept in the regression and at least one, but not all, of the slope coefficients is zero.
- all slope coefficients are zero.

## Question 2

1 / 1 pts

Consider a regression in which a coefficient suffers from downward omitted variable bias. If you add a regressor that controls for the omitted variable bias:

- (●) The new estimate will be larger
- ( ) The new estimate will be smaller.
- ( ) The new estimate will remain unchanged.
- ( ) Can’t determine

## Question 3

**1 / 1 pts**

If the estimates of the coefficients of interest change substantially across specifications,

- ( ) then you should change the scale of the variables to make the changes appear to be smaller.
- ( ) then choose the specification for which your coefficient of interest is most significant.
- ( ) then this can be expected from sample variation.
- (●) then this often provides evidence that the original specification had omitted variable bias.

## Question 4

1 / 1 pts

The following linear hypothesis can be tested using the *F*-test with the exception of

- (●) $\beta 2 = 1$ and $\beta 3 = \beta 4/\beta 5$.
- ( ) $\beta 1 + \beta 2 = 1$ and $\beta 3 = -2\beta 4$.
- ( ) $\beta 2 = 0$.
- ( ) $\beta 0 = \beta 1$ and $\beta 1 = 0$.

## Question 5

1 / 1 pts

Suppose you have two regression models and you decide to test which model fits the data better. You use a F-test with 2 restrictions and the value of the F-test is 8.01. At 5% significance level, you conclude that the unrestricted model fits the data better than the restricted model.

- ( ) False

True

## Question 6

1 / 1 pts

When comparing the estimated effect of pollution on house prices between Regr 1 and Regr 2, you conclude that:

Regr 1 suffers from downward omitted variable bias because larger houses tend to be located in regions with lower levels of pollution.

Regr 1 suffers from upward omitted variable bias because larger houses tend to be located in regions with lower levels of pollution.

Regr 2 suffers from downward omitted variable bias because larger houses tend to be located in regions with lower levels of pollution.

None of the others.

## Question 7

1 / 1 pts

When comparing the estimated effect of pollution on house prices between Regr 2 and Regr 3, you conclude that:

- (selected) Regr 2 suffers from upward omitted variable bias because regions located further away from employment centers tend to be regions with lower levels of pollution
- Regr 3 suffers from upward omitted variable bias because regions located further away from employment centers tend to be regions with lower levels of pollution.
- Regr 2 suffers from downward omitted variable bias because regions located closer to employment centers tend to be regions with higher levels of pollution.
- There is no omitted variable bias in either two regressions.

## Question 8

1 / 1 pts

Using Regr 2, you want to test the joint hypothesis that the coefficient on nox =0 and coefficient on stratio=0 and coefficient on rooms =0.

The F-test is 251.55 and you can conclude that at least one of the three variables need to be in the regression.

All three variables are statistically different than 0 at 1% or less and thus all three variables need to be in the regression.

None of the others.

F-test is 251.55 and you can conclude that all the three variables need to be in the regression.

## Question 9

1 / 1 pts

Using Regr 3, you decide to test whether the coefficient on stratio=0 and the coefficient on dist=0.

The heteroskedasticity-robust F-test is 4.32 and you can conclude that at least one of these variables needs to be in the model.

The heteroskedasticity-robust F-test is 71 and you can conclude that at least one of these variables needs to be in the model.

The heteroskedasticity-robust F-test is 123 and you can conclude that at least one of these variables needs to be in the model.

None of the others.

## Question 10

1 / 1 pts

Using Regr 3, you decide to test whether the coefficient on stratio is equal to the coefficient on dist.

The heteroskedasticity-robust F-test is 71 and you fail to reject the null hypothesis at 5% level.

The heteroskedasticity-robust F-test is 2.11 and you fail to reject the null hypothesis at 5% level.

The heteroskedasticity-robust F-test is 2.11 and you can reject the null hypothesis at 5% level.

The heteroskedasticity-robust F-test is 71 and you can reject the null hypothesis at 5% level.

Quiz Score: **10** out of 10