Quiz 6

Instructions

For questions 4-10, 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 4 regressions:

Regr 1: Regress house prices (in thousands USD) on nox, stratio, rooms, and rooms^2 (rooms squared) and dist

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

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

Regr 4: Regress log of house prices (in thousands USD) on log of nox, stratio, rooms, log of dist and the interaction term between log of dist and log of nox

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

Question 1

The interpretation of the slope coefficient in the model $Yi = \beta 0 + \beta 1 \ln(Xi) + ui$ is as follows:

○ a change in X by one unit is associated with a $\beta 1$ change in Y.

○ a change in X by one unit is associated with a $\beta 1$ 100% change in Y.

○ a 1% change in X is associated with a $\beta 1$ % change in Y.

● a 1% change in X is associated with a change in Y of 0.01 $\beta 1$.

Question 2

You have estimated the following equation:

Test Scores = 607.3 + 3.85 *Income* – 0.0423 *Income*^2,

where *TestScore* is the average of the reading and math scores on the Stanford 9 standardized test administered to 5th grade students in 420 California school districts in 1998 and 1999. *Income* is the average annual per capita income in the school district, measured in thousands of 1998 dollars. The equation

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◉ suggests a positive relationship between test scores and income for most of the sample.

○ does not make much sense since the square of income is entered.

○ is positive until a value of Income of 610.81

○ suggests a positive relationship between test scores and income for all of the sample.

Question 3

In the regression model $Y_i = \beta_0 + \beta_1 X_i + \beta_2 D_i + \beta_3 (X_i \times D_i) + u_i$, where X is a continuous variable and D is a binary variable, to test that the two regressions are identical (i.e. the relationship between Y and X is best described by one line), you must use the

○ t-statistic separately for $\beta2 = 0$, $\beta2 = 0$.

● F-statistic for the joint hypothesis that $\beta2 = 0$, $\beta3 = 0$.

○ F-statistic for the joint hypothesis that $\beta0 = 0$, $\beta1 = 0$.

○ t-statistic for $\beta3 = 0$.

Question 4

1 / 1 pts

In Regr 1, the estimated relationship between house prices and rooms is best described by:

○ a line

○ two lines

○ an inverted U-shape

● a U-shape

Question 5

1 / 1 pts

Using Regr 1, Test the quadratic model is better than the linear model. You conclude that:

○ Both models fit equally well.

◉ The quadratic model is better than the linear model.

○ The linear model is better than the quadratic model.

○ Cannot determine

Question 6

1 / 1 pts

In Regr 2, holding everything else constant, we can conclude that:

○ An increase in pollution by 1 part, decreases house prices by 0.0016%

○ An increase in pollution by 16%, decreases house prices by $1000.

○ An increase in pollution by 1 part, decreases house prices by 0.16%

◉ An increase in pollution by 1 part, decreases house prices by 16%

Question 7

1 / 1 pts

In Regr 3, holding everything else constant, we can conclude that:

○ An increase in pollution by 1% will decrease the median house price by 95%.

◉ An increase in pollution by 1% will decrease the median house price by 0.95%.

○ An increase in pollution by 1 part will decrease the median house price by 0.95%.

○ An increase in pollution by 1 part will decrease the median house price by 95%.

Question 8

1 / 1 pts

In Regr 4, holding everything else constant, we can conclude that the estimated effect of nox on house prices is (Hint: check the descriptive stats of distance in the data):

○ decreasing in distance (in absolute value) and becomes positive for higher values of distance.

○ increasing in distance (in absolute value) and becomes positive for higher values of distance.

○ increasing in distance (in absolute value) and is negative for the entire sample

○ decreasing in distance (in absolute value) and is negative for the entire sample

Question 9

1 / 1 pts

In Regr 4, holding everything else constant, we can conclude that the estimated effect of distance on house prices is (Hint: check the descriptive stats of nox in the data):

○ Positive for the entire sample.

◉ Positive for higher values of nox.

○ Positive for lower values of nox.

○ Negative for the entire sample.

Question 10

1 / 1 pts

Comparing Regr 2, Regr 3, and Regr 4, we can conclude that:

○ Regr 3 fits better than Regr 2 or 4.

○ Regr 2 fits better than the Regr 3 or 4.

● Regr 4 fits better than Regr 2 or 3.

○ Cannot determine.

Quiz Score: **10** out of 10