Applied Econometrics Name:

Midterm exam

You can use your notes, the presentations, and the text. You should not work with other people.

Please send your work to me: [derrell@fordham.edu](mailto:derrell@fordham.edu)

The midterm is due Thursday, October 22.

1. The table below gives the estimated coefficients and their p-values for the following regression. The p-values are for the two-sided test of statistical significance. D is a dummy variable.

|  |  |  |
| --- | --- | --- |
|  | Estimated coefficient | P-value |
| X1 | -0.52 | 0.145 |
| X2 | 1.23 | 0.023 |
| D | 0.44 | 0.078 |

a) What is the estimated value of y when x1 = 5, x2 = 10, and D = 1? (Beta0 = 2)

b) Interpret the estimated value of beta1. Is beta1 statistically significant at the 10% level?

c) Suppose we had thought that beta1 should be negative. Is beta1 significantly negative at the 10% level?

d) Interpret the estimated value of beta2. Is beta2 statistically significant at the 5% level?

e) What is the intercept when D = 0? What is the intercept when D = 1?

f) You are considering the addition of another variable, x4, to the regression. You believe that x4 has a positive effect on y. You think that x4 is positively correlated with x2, but is not correlated with x1 or D. In the above reported regression, which coefficient (or coefficients) might be biased by the omission of x4? What is the direction of the expected bias?

2. Estimated regressions

a)

Interpret the slope coefficient in the above estimated regression equation.

b)

Interpret the slope coefficient in the above regression equation.

c)

In the above regression equation, D is a dummy variable.

What is the estimated slope coefficient when D = 0?

What is the estimated slope coefficient when D = 1?

d)

What is the estimated slope coefficient when x = 4?

3. A scatter plot of y and x shows a u-shaped relationship. Write a regression equation that will fit this relationship.

4. You believe x1 and x2 both have positive effects on y. You also believe that the effect of x1 on y grows stronger as x2 increases. Write a regression equation to fit these relationships.

5. OLS regression assumes that the mean of the error terms is zero. What must you do to assure that this assumption is met?

6. Consider the following regression equation. Write the null and alternative hypotheses for the test of the overall significance of the regression. Why would you perform this test?

7. Consider the linear probability model from your last homework assignment. Use the same data. Add the first lag of the dependent variable:

Report the estimated regression equation. Comment on the statistical significance of the slope coefficients. Is this model better than the model without *Recesst-1*? Why or why not?

8. What is the topic of your research paper? What is the dependent variable? What are the independent variables? Where will you get the data? This question will not be graded but please provide answers.