Applied Econometrics Using Stata, SS 2017

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The exam consists of two parts. You have 45 minutes to complete the <u>first part</u> of the exam. This part comprises a pencil-and-paper test and <u>you may not use anything besides a pencil</u>. We will notify you when the first part of the exam ends and collect your answer sheets. Thereafter, we will move to the computer-based exam, for which you will have another 75 minutes. During this part of the exam, you may use your textbooks, course materials and personal notes. Please remember that cheating at the exam is an academic offence and will be punished to the fullest extent. We both wish you good luck!

Part I

1. OLS Estimation (20 Points)

(a) Assume we want to explain whether individual managers from German car manufacturing companies engaged in some form of fraud. The explanatory variables are yearly wage (measured in Euro) and gender (a dummy variable equal to 1 for males and 0 otherwise). Explain <u>precisely</u> what econometricians understand under the following assumptions: linearity in parameters, random sampling, no perfect collinearity, zero conditional mean, and homoscedasticity. Use the example provided to make your points clear. (10 Points)

(b) Does it make sense to include the monthly wage or the general creativity of the managers as additional explanatory variables in the model? Explain your response. (4 Points)

(c) Imagine one of the car manufacturing companies invites you to run an empirical study with the goal to detect fraud among managers. The CEO studied economics as well and asked you which data you need and which estimators you are going to use. What do you respond? Justify your arguments. (6 Points)

2. Endogeneity Problems (16 Points)

(a) Frequently, econometric models suffer from endogeneity. What types of endogeneity can occur in an econometric model and which classical assumption are then violated? (4 Points)

(b) Imagine you are estimating the effect of what makes a start-up company successful. You collect data on the founders, but cannot get a measure of their innate creativity. How could you solve this problem? Which estimators might be suitable? What kind of data would you have to collect? (6 Points)

(c) How can we interpret marginal effects for discrete and continuous explanatory variables in Logit and Probit models? How does the interpretation differ from simple OLS regressions? What is the difference between average marginal effects and marginal effects at the mean? Which of the two is more appropriate for interpretation? (6 Points)