Exam SØK3515 Microeconometrics and Analysis of Panel Data, spring 2022

Question 1 (Weight 1/3)

A researcher will carry out an empirical study of how unionization affects firm level wages. The researcher formulates the following panel data model:

$$(1) \; \mathrm{Ln} w_{it} = \beta_1 \ln VA_{it} + \beta_2 UD_{it} + \lambda_t + \eta_i + \varepsilon_{it}$$

where w_{it} is the average wage rate in firm i, year t, VA_{it} is value added per worker in firm i, year t, UD_{it} is the share of unionized workers (below called union density) in firm i, year t, λ_t are time effects, η_i are firm specific effects, and ε_{it} an idiosyncratic error term.

a) Briefly explain how the unknown parameters can be estimated and discuss strengths and weaknesses of different methods.

b) The researcher wants to test whether the marginal effect of value added is affected by union density in firm i, year t. Explain how this can be done.

c) The researcher is worried about possible econometric problems since union density may be an endogenous variable. Explain these possible problems and how such problems with endogeneity may be handled.

d) A commentator argues that wages are slowly adjusted to changes in the explanatory variables. Discuss how this argument can be taken into account and further discuss different econometric methods that can be used to estimate the unknown parameters.

Question 2 (Weight 1/3)

Another researcher will investigate how different factors affect individuals' migration decision. The researcher uses cross section data with individual specific information about age, gender, and years of education along with data for the unemployment rate at the municipality level.

The researcher first uses a data set with information which enables identification of whether an individual is moving out of the municipality during the year or are staying in the same municipality.

a) Discuss model specification, how the unknown parameters in the model can be estimated and how the results can the interpreted.

The researcher now collects new data with information which enables identification of whether an individual moves to a municipality within the same county, moves to a municipality outside the county, or stay in the same municipality.

b) Discuss model specification, how the unknown parameters in the model can be estimated and how the results can the interpreted also in this case.

Question 3 (Weight 1/3)

You are planning an econometric study of factors that affect travel-to-work expenditures and will use data from a survey sent to all employees at NTNU with questions about travel-to-work expenditures last week, income, distance from home to the workplace, and individual characteristics like gender, age and so on.

Discuss econometric challenges and how these may be handled in the following cases:

a) A non-negligible share of the respondents reports zero expenditures since they walk to and from job, go by bike and so on.

b) Due to some confusing wording in the questionnaire, employees with zero expenditures did not report travel-to-work expenditures.