

MBA 753: Causal Inference Methods in Business Analytics

Assignment 3

Note: Please name the file as follows: “your roll number - your first name”, for example: “123456789 - Nivedita”. Save it as a pdf and submit.

Q1. Use the Card & Krueger data to study the effect of increase in minimum wage. Consider two covariates (or control or predictor variables) – whether the outlet is owned by a company and number of hours open per day. [20 marks]

- Which quasi experimental design are you likely to use and why?
- What are the design variables i.e., the outcome and other important predictors pertaining to the design?
- Write the regression equation for the model under consideration.
- Do increases in minimum wage affect employment?
- Perform falsification test. What are your conclusions with respect to the causal effect obtained above?

Q2. Use Alcohol data to study the effect of alcohol consumption on the mortality rate. Consider overall mortality rate to be the outcome of interest. [20 marks]

- Write the regression equation for the model used.
- What is the LATE estimate based on the regression model? Interpret the estimate.
- Use the optimal bandwidth method to determine robust estimate of LATE?
- What is the sample size used in the estimate of LATE using optimal bandwidth method?
- Compare the LATE estimates from the regression model and the optimal bandwidth method.

Q3. Use the data Mroz.csv, collected by Thomas Mroz (1987) to study married women’s hours of work. The following link provides the codebook for the data -

<https://www.rdocumentation.org/packages/npsf/versions/0.4.2/topics/mroz> . Study the effect of experience and education on the wages earned. Assume that education is exogeneous whereas experience is endogenous. Number of hours worked is used as an instrument for the endogenous variable. Use participation in labour force and age as covariates. [20 marks]

- Write the IV regression equation for the above model.
- Fit an OLS regression model first. Interpret the effect of education and experience on wages.
- Fit a 2SLS regression model. Interpret the effect of education and experience on wages.
- Compare the SE of education and experience in the two regression models. Does the significance of hypothesis test change?